ERRATUM

In July Number, p. 337, l. 7 from the foot, *Heymann* should read *Herzog*.

ARCHIVES

OF

OPHTHALMOLOGY

FOUNDED IN 1869 BY

DR. HERMAN KNAPP

EDITED IN ENGLISH AND GERMAN

BY

DR. ARNOLD KNAPP
OF NEW YORK

AND

DR. C. HESS
OF WÜRZBURG

AND

DR. W. A. HOLDEN
OF NEW YORK

VOLUME XLI.

NEW YORK

G. P. PUTNAM'S SONS { 2, 4, & 6 WEST 45TH STREET
27 & 29 WEST 23D STREET

AND NEW ROCHELLE, N. Y.

LONDON: 24 BEDFORD STREET, STRAND

WIESBADEN: J. F. BERGMANN'S Verlag

PARIS: J. B. BAILLIÈRE, 19 Rue Hautefeuille

1912

The Knickerbocker Press, New York

CONTENTS OF VOLUME XLI.

NUMBER 1.

PAGE

1. **The Advantages of a Preliminary Capsulotomy Especially in Immature Cataracts.** By HOMER E. SMITH, M.D., Norwich, New York. (With two illustrations in the text) 1

2. **Noguchi's Cutaneous Luetin Reaction and its Application in Ophthalmology.** By MARTIN COHEN, M.D., New York . . 8

3. **Detailed Report on 358 Cataract Extractions Performed at Jullundur, Punjab, India, in October, 1909, at Col. Henry Smith's Clinic; with Complete Statistical Tables.** By DERRICK T. VAIL, M.D., Cincinnati, Ohio, U. S. A. . . . 16

4. **A Mixed Tumor of the Lachrymal Gland.** By GEORGE H. KNAPP, M.D., Cincinnati. (With two illustrations on Text-Plate I.) . 25

5. **Individual Differences of the Normal Ciliary Body. A Contribution to the Study of Glaucoma.** By Professor C. HESS, Würzburg. Translated from the German Edition of these ARCHIVES for October, 1910, by Dr. MATTHIAS LANCKTON FOSTER. (With eight illustrations on Appended Plates VI. and VII.) . 29

6. **Report of the Thirty-seventh Meeting of the German Ophthalmological Society at Heidelberg, August 3-5, 1911.** Abridged Translation from Vol. LXX., No. 1, German Edition of these ARCHIVES, by Dr. PERCY FRIDENBERG, New York . . . 39

7. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom.** By Mr. C. DEVEREUX MARSHALL . . 63

8. **Report of the Proceedings of the Section on Ophthalmology of the New York Academy of Medicine.** By the Late Dr. E. B. COBURN, Secretary 70

9. **Report of the Proceedings of the Section on Ophthalmology of the British Medical Association** (*Continued*). By Mr. C. DEVEREUX MARSHALL 83

250922

NUMBER 2.

PAGE

1. **A Simplified Method of Extirpation of the Lachrymal Sac.** By C. BARCK, St. Louis. (With three illustrations on Text-Plate II.) 97

2. **A Case of Retrobulbar Pneumococci Abscess of the Right Orbit.** By HOWARD V. DUTROW, M.D. 100

3. **An Unusual Case of Epibulbar Sarcoma.** By F. H. VERHOEFF, A.M., M.D., Boston. (With two illustrations on Text-Plate III.) 104

4. **Additional Notes on a Patient with High Astigmatism.** By Dr. B. L. MILLIKIN, Cleveland, Ohio 109

5. **Exceptional Causes of Failure in the Operative Treatment of Strabismus.** By Professor ALFRED BEILSCHOWSKY. Translated from the *Archiv f. Augenheilkunde*, German Edition of these ARCHIVES, Vol. LXIX., 1911, by Dr. SELINA BLOOM, New York 114

6. **A Case of Incongruous Homonymous Hemianopsia.** By Dr. OTTO SCHIRMER. (With two cuts in the text.) 136

7. **The Operation of Excision of Tarsus and Conjunctiva (Heisrath) in Old Trachoma, Together with Demonstration of a New Instrument, and a Description of a New Method of Performing it.** By J. HERBERT CLAIBORNE, M.D., New York. (With six illustrations in the text.) 141

8. **A Report of a Case of Antral Disease in a Four-Months-Old Child, with Marked Orbital Symptoms.** By FREDERICK KRAUSS, M.D., Philadelphia 150

9. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom.** By Mr. C. DEVEREUX MARSHALL . 153

10. **Report of the Proceedings of the Section on Ophthalmology of the New York Academy of Medicine.** By Dr. MARTIN COHEN, Secretary 157

11. **Systematic Report on the Progress of Ophthalmology in the Third and Fourth Quarters of the Year 1910.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and

PAGE

others. Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER 165

A.—SCHWEIGGER: Lids, 165; Lachrymal organs, 166; Orbits and accessory sinuses, 169; Conjunctiva, 176; Cornea, sclera, anterior chamber, 183.

B.—NICOLAI: Lens, 188; Iris, 191.

C.—HUMMELSHEIM: The pupil, 193.

D.—NICOLAI: Chorioid, 193; Vitreous, 195; Glaucoma, 196; Sympathetic ophthalmia, 200.

E.—MEYER: Retina and functional disturbances 201.

12. **Book Reviews** 203

I. **Anatomie und Histologie des Menschlichen Augapfels. Seine Entwicklung und sein Altern. (The Anatomy and Histology of the Eyeball.)** By Prof. MAXIMILIAN SALZMANN, Vienna.

II. **Pathology and Bacteriology of the Eye.** By E. TREACHER COLLINS and M. STEPHEN MAYOU.

III. **The Pocket Atlas and Text-Book of the Fundus Oculi.** By Dr. G. LINDSAY JOHNSON.

IV. **Atlas der Entwickelungsgeschichte des Menschlichen Auges. (Atlas of the Embryology of the Eye.)** By Prof. L. BACH and Dr. R. SEEFELDER.

V. **The Ophthalmic Year Book, Volume VIII.** By E. JACKSON, T. B. SCHNEIDEMAN, and W. ZENTMAYER.

VI. **Manual of the Diseases of the Eye.** By Dr. CHARLES H. MAY.

VII. **Retinoscopy.** By Dr. JAMES THORINGTON.

VIII. **Traitement Adjuvant du Strabisme. (Adjuvant Treatment of Strabismus.)** By F. TERRIEN and HUBERT.

IX. **Le Choix des Verres et de leurs Montures en Ophtalmologie. (The Selection of Glasses and their Mountings.)** By Dr. M. CAILLAUD.

NUMBER 3.

1. **Report of a Case of Vessel-Formation in the Vitreous.** By Dr. JOHN DUNN, Richmond, Va. (With one illustration on Text-Plate IV.) 209

PAGE

2. **The Skiascopic Test.** A New and Original Explanation. By R. GRANVILLE WADDY, M.B., Ch.M. (Syd.), D.O. (Oxon.), Oxford, England. (With seven figures in the text.) . . 217

3. **The Eye Syndrome of Dementia Præcox.** By Dr. H. H. TYSON, and Dr. L. PIERCE CLARK, New York. (With three colored drawings on Appended Text-Plate.) 223

4. **Some Ocular Manifestations of Syphilis and Parasyphilis of the Nervous System.** By Dr. GEORGE H. KNAPP, Cincinnati 235

5. **Tuberculosis of Conjunctiva and Sclera, Following Removal of a Pigmented Papilloma of the Conjunctiva.** By Dr. LUTHER C. PETER, Philadelphia 240

6. **A Further Communication on My Ocular Muscle-Tucking or Shortening Operation.** By Dr. GEORGE A. SUFFA, Boston, Mass. (With six figures in the text) 245

7. **Remarks on Some of the Recent Essays Concerning the Pathology of the Lens.** By Professor C. HESS, Würzburg. Translated from *Archiv f. Augenheilkunde*, 1911, No. 1, by Dr. MATTHIAS LANCKTON FOSTER, ... 259

8. **A Successful Method of Corneal Transplantation.** By Privatdozent Dr. WALTHER LÖHLEIN. Translated by Dr. ALFRED BRAUN, New York, from the *Archiv f. Augenhlk.*, Vol. LXVII., 1910. (With one Appended Plate and three figures in the text.) 266

9. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom.** By C. DEVEREUX MARSHALL, F.R.C.S. 286

10. **Report of the Proceedings of the Section on Ophthalmology of the New York Academy of Medicine.** By Dr. MARTIN COHEN, Secretary 294

11. **Systematic Report on the Progress of Ophthalmology in the Third and Fourth Quarters of the Year 1910.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER 303

PAGE

A.—MEYER: Retina and functional disturbances (*continued*), 302; Optic nerve, 306; Injuries, foreign bodies, parasites, 309; Ocular troubles in general disease, 313

12. **Obituary**—CARL HORSTMANN 321

13. **Book Reviews** 321

X. **The Prescribing of Spectacles.** By A. S. PERCIVAL.

XI. **Handbook of the Diseases of the Eye.** By Sir H. R. SWANZY and L. WERNER.

NUMBER 4.

1. **The Treatment of the Early Stages of Senile Cataract.** By Lieutenant-Colonel HENRY SMITH, M.D., V.H.S., I.M.S., Amritsar. 323

2. **Two Cases of Epibulbar Sarcoma.** By Dr. CARL KOLLER, New York. 327

3. **The Trachoma Question.** By Dr. K. LINDNER, Vienna, Austria. 333

4. **Simple Flap Extraction of Senile Cataract, with Peripheric Incision of the Iris.** By Professor ELSCHNIG, in Prague. Translated from the *Arch. f. Augenheilk.*, Vol. LXIX., 1911, the German Edition of these ARCHIVES. 342

5. **Remarks on Elschnig's Article on Cataract Extraction.** By Professor C. HESS. 349

6. **The Size of the Blind Spot and its Distance from the Point of Fixation in the Emmetropic Eye.** By J. VAN DER HOEVE, Utrecht, Holland. Translated from the *Arch. f. Augenheilk.*, Vol. LXX., No. 2, 1911. 350

7. **Retinal Lipæmia in Severe Diabetes.** By Dr. C. G. DARLING. (With one drawing on Text-Plate V.) 355

8. **Concerning Metastatic Inflammations of the Eye in Gonorrhœa.** By Docent Dr. SIDLER-HUGENIN, Zurich. Translated by Dr. ALFRED BRAUN, New York, from *Arch. f. Augenheilk.*, Vol. LXIX, 1911. 360

9. **Report of the Proceedings of the Section on Ophthalmology of the New York Academy of Medicine.** By Dr. MARTIN COHEN, Secretary. 377

10. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom.** By Mr. C. DEVEREUX MARSHALL, F.R.C.S. 386

PAGE

11. **Systematic Report on the Progress of Ophthalmology in the First and Second Quarters of the Year 1911.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, and Dr. R. SCHWEIGGER, in Berlin, with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER . . 391

A.—ABELSDORFF: General ophthalmological literature, 391.

B.—ZIEMSSEN: General pathology, diagnosis, and treatment, 393; Remedies and instruments, 398.

C.—ABELSDORFF: Anatomy, 401; Physiology, 402; Refraction and accommodation, 404; Muscles and nerves, 407.

D.—SCHWEIGGER: Lids, 411; Lachrymal organs, 414; Orbits and accessory sinuses, 415; Conjunctiva, 418; Cornea, sclera, anterior chamber, 425.

NUMBER 5.

1. **Hereditary Optic Atrophy with X-Ray Findings.** By Dr. WILLIAM EVANS BRUNER, Cleveland. (With a radiograph on Text-Plate VI. and five charts in text.) 435

2. **Polypoidal Formation in the Lacrimal Sac.** By Dr. FREDERICK TOOKE, Montreal, Can. (With two figures on Text-Plate VII.) 446

3. **A Case of Chloroma.** By Dr. ROBERT SATTLER, Cincinnati. (With three figures on Text-Plate VIII.) 452

4. **Amblyopia from Inhalation of Methyl Alcohol.** By Dr. HENRY H. TYSON, New York. (With eight charts of field of vision in the text.) 459

5. **Syphilis of the Orbit. Report of an Unusual Case.** By Dr. OSCAR DODD, Chicago. 472

6. **Recurrent Retinal Hemorrhages Occurring in the Young, with the Report of a Case.** By Dr. A. EDWARD DAVIS, New York. 478

7. **Report of Six Cases of Degeneration of the Cornea in the Same Family (Nodular Keratitis).** By Dr. DUNBAR ROY, Atlanta. (With three figures on Text-Plate IX.) 490

PAGE

On the Various Causes of Monocular Diplopia. By Dr. ERNST WOELFFLIN, Privat-dozent, Basle. Translated by Dr. ALFRED BRAUN, New York. 496

9. **Hemeralopia.** By Prof. C. HESS. (With one diagram in the text.) Abridged Translation from the *Archiv f. Augenheilkunde*, 1911, No. 2, by Dr. MATTHIAS LANCKTON FOSTER. . 505

10. **Report of the Proceedings of the Section on Ophthalmology of the New York Academy of Medicine.** By Dr. MARTIN COHEN, Secretary. 512

11. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom.** By C. DEVEREUX MARSHALL, F.R.C.S. 518

12. **Systematic Report on the Progress of Ophthalmology in the First and Second Quarters of the Year 1911.** By Dr. G. ABELSDORFF, in Berlin; Prof. St. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, and Dr. R. SCHWEIGGER, in Berlin, with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER . . 527

A.—NICOLAI: Lens, 527; Iris, 531; Chorioid, 535; Vitreous, 536; Glaucoma, 537.

B.—MEYER: Sympathetic ophthalmia, 539; Retina and functional disturbances, 540; Optic nerve, 543: Injuries, foreign bodies, parasites, 550; Ocular troubles in general disease, 552.

13. **Book Review** 556

XII. **The Pituitary Body and its Disorders.** By HARVEY CUSHING, M.D.

NUMBER 6.

1. **Distortions of the Visual Fields in Cases of Brain Tumor. Binasal Hemianopsia.** By Dr. HARVEY CUSHING and Dr. CLIFFORD B. WALKER, Boston. (With twenty-seven line cuts in the text and five half-tones on Text-Plates X–XII.) . . 559

2. **A Simplified Gram-Technique.** By Dr. WALTER HAMILTON SNYDER, Toledo, O. 599

3. **Additional Experiments on the Excretion of Hexamethylenamine in the Ocular Humors.** By Dr. LLOYD B. WHITHAM, Baltimore, Md. 604

PAGE

4. **Details of Vision of 132 Cases of Intracapsular Extraction of Cataract.** By Lieutenant-Colonel HENRY SMITH, M.Ch. . 608

5. **Report on the Proceedings of the Section on Ophthalmology of the New York Academy of Medicine.** By Dr. MARTIN COHEN, Secretary 615

6. **Report of the Proceedings of the British Medical Association, Section on Ophthalmology.** By Mr. C. DEVEREUX MARSHALL. 622

7. **Systematic Report on the Progress of Ophthalmology in the Third and Fourth Quarters of the Year 1911.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, and Dr. R. SCHWEIGGER, in Berlin, with the Assistance of Prof A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof DA GAMA PINTO, Lisbon; and Others. Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER . . 642

A.—HOEHMANN: General ophthalmological literature, 642; General pathology, diagnosis, and treatment, 643; Remedies and instruments, 645.

B.—ABELSDORFF: Anatomy, 646; Physiology, 646; Refraction and accommodation, 648; Muscles and nerves, 649.

C.—SCHWEIGGER: Lids, 652; Lachrymal apparatus, 654; Orbits and accessory sinuses, 655; Conjunctiva, 656; Cornea, sclera, anterior chamber, 658

D.—NICOLAI: Lens, 660; Iris, 661; Chorioid, 663; Vitreous, 665; Glaucoma, 665; Sympathetic ophthalmia, 666.

E.—MEYER: Retinal and functional disturbances, 666; Optic nerve, 668; Injuries, foreign bodies, parasites, 669.

8. **Index of Authors and Subjects, Vol. XLI.** 671

VOL. XLI. No. 1

ARCHIVES OF OPHTHALMOLOGY.

THE ADVANTAGES OF A PRELIMINARY CAPSULOTOMY ESPECIALLY IN IMMATURE CATARACTS.

BY HOMER E. SMITH, M.D., NORWICH, NEW YORK.

(With two illustrations in the text.)

ANY perfected surgical procedure is a matter of evolution, and the steps in this are of value to the operator in the added skill attained and in the improvement of his technique. To other surgeons it is of worth only in so far as one is able to impart his own convictions of its value and to clearly present his description thereof. Much better work can be done and less useless experimentation made if one is familiar with that done by others and their results along the same objective lines. In its inception, with the writer the operation was evolved from some forgotten reading by unconscious mental processes, but the technique is his own, and its most valuable feature—the interval between the capsulotomy and the extraction proper, is his own discovery. In 1906 when the subject was presented before the American Academy of Ophthalmology it elicited no comment as to this method having been extensively and successfully used by others abroad, nor did the writer know this himself until the matter was called to his attention by Dr. F. W. Marlow of Syracuse. He wrote that he himself thought he had originated this method of opening the capsule, and had operated in such manner, and that the method had been used by several operators. Research into the matter showed that about 1880 the Spanish surgeon Delgado did a similar operation, that in 1884 Drake-Brockman did likewise. In 1888 Heimel of Leipsic

advocated a method of removing a central disk from the anterior capsule, before the extraction, by means of a small knife which was to be passed into the anterior chamber and made to describe a circular cut in the pupillary space. In 1890 Dr. J. T. Tyner wrote[1] on "Preliminary Capsulotomy in the Extraction of Cataract," and stated that he had been unable to find a precedent for the operation. Drake-Brockman reports[2] on over 2100 cases operated upon by this method, and his statistics seem to leave no doubt of the value of the procedure. He operates by means of a Bowman's stop-needle immediately before the extraction. He calls his operation Primary Capsule Rupture. There is a distinction between this term and preliminary capsulotomy, the latter carrying the idea of an interval elapsing between this step and those that are to follow.

This brief historical sketch is given to show that the underlying idea must have value to have so forced itself upon the minds of so many men so widely separated by time and distance, that the difficulties, the inefficiencies, and the dangers of the ordinary capsulotomy were recognized and that a better way out of these was being sought. To this day primary capsule rupture is the routine method with many operators in the Indian Empire, and this alone was my own thought when for the first time I essayed the operation, but an incident occurring in the capsulotomy forced me into making this a preliminary step to the extraction, and the final outcome of the operation gave me the first clue to its advantages in immature cataracts.

The patient, Mrs. A. H., aged 46, came to me because of failing sight. Her vision equalled $\frac{10}{200}$ in both eyes, not improvable by glasses. The ophthalmoscope showed cortical cataracts with clear lens matter underlying the capsule. She was advised to wait further maturation, but she was so hampered in her household duties that she urged immediate operation. The dangers were explained to her, but she was insistent, and with many misgivings I consented and the operation hour was set for 5 P.M. on the following day. When the capsulotomy had been made, it was found on withdrawing the knife that there was no anterior chamber, the aqueous leaking out through the corneal puncture.

[1] *N. Y. Med. Jour.*, Sept. 20th.

[2] *The Ophthalmic Review*, Aug., 1884, Nov., 1888.

The remainder of the operation was therefore postponed to the following morning. I have since learned that the Indian operators, when this occurs, cause the anterior chamber to be re-formed by applying the tip of the irrigator to the corneal wound and allowing to flow into the eye sufficient normal saline solution. A combined extraction had been planned, for there was every reason to expect a sticky lens, but in the morning it was seen that the lens had become much more opaque, so the iridectomy was left to be done after the extraction, should it be found that much cortical matter was being left and if irrigation should be necessary to the final toilet. To my astonishment as well as satisfaction the lens was delivered with ease. No cortical matter was left behind, and there remained a clear, black, and round pupil. No subsequent opacity developed in the pupillary space, and after a short and uninterrupted convalescence she got, one month later, $\frac{20}{30}$ vision with proper correction. It was inferred that, during the night, the aqueous, through the ample capsulotomy, had insinuated itself between capsule and cortex, producing thereby a separation of the two.

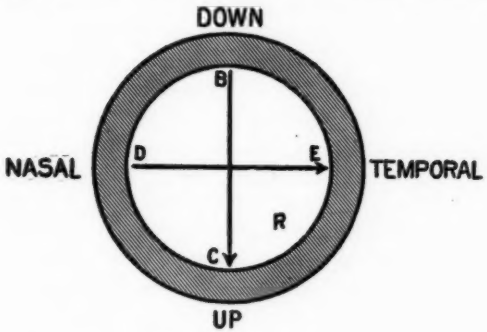
Subsequent experiences make this inference more likely a certainty. What is positively sure is that the lens is more easily delivered and the posterior capsule left free from adherent clear lens matter. This first experience showed that the knife-needle was ill adapted to this operation. The blade is 5*mm* long and the space wherein it is to be used is but 2.6*mm* deep. Furthermore, the instrument is puncture sharp but not cutting sharp clear up to the point. This fault makes it drag on the lens and might produce a dislocation. Therefore Tiemann & Co. were instructed to make a knife whose shape should be that of a miniature scalpel whose shank should be slender and to just fill the corneal puncture made by the blade, the latter to have a cutting surface 2*mm* long. A cut of this is herewith appended and they have given this knife my name. When later on technique is taken up it will be seen how important are all these features, and I have no doubt that the others who took up this method of opening the capsule and later abandoned it did so on account of the almost impossibility of successfully making an easy and ample

capsulotomy with the usual stock knife-needle. Encouraged by the success of the first operation, a preliminary capsulotomy was adopted as a routine measure in every type of cataract, and further experience showed that it possessed another great advantage. In mature and hypermature cataracts it enables one to determine in advance the size of the corneal section he will later make. If, when making the capsulotomy, the cut in the capsule is practically invisible, then is it known that a large nucleus is present and that the usual section of the upper two-fifths of the cornea will be necessary for the easy exit of the lens. If the sub-capsular lens substance has undergone softening, there will exude from the capsular cut semi-gelatinous matter, and the corneal section need then comprise but the upper third, while if a milky liquid escapes, it is known that only a small nucleus remains, and the section may be made with the angular keratome.

It is well known that the nearer one succeeds in making the corneal section in a single plane the surer and speedier will be the healing process. One is more certain of the accuracy of this section in inverse proportion to its size, and it is an immense advantage to know in advance just how large this need be to assure an easy delivery of the lens, for the smaller this is, consistent with the object in view, the better will be the patient's chances. Operators who dread a hypermature cataract will find by this method that they, of all others, are the easiest. It is understood that the operation to be described is applicable only to such cases as one would intelligently choose for the simple extraction, and is not the operation of choice where the iris lacks the lustrous appearance of health, where the lens is amber-colored or dark gray, where the pupil has little dilating ability, or in the very aged. These should have a preliminary iridectomy. Even when this is necessary the capsulotomy is made in advance of the extraction proper. The operation itself is performed as follows:

The pupil is first fully dilated by a two per cent. solution of homatropine, the technique of asepsis is then carried out and the eye cocainized. The operator, standing at the head of his patient if he is right-handed and it is the right eye, the speculum having been introduced, takes a firm and deep grasp with the fixation forceps over the insertion of the internal

rectus muscle. The capsulotomy knife, with the cutting surface of the blade toward the operator, is thrust through the cornea at A and the blade carried down to the lower margin of the dilated pupil at B; the handle is made to describe an arc of a circle away from the operator, the blade describing a lesser arc having as its radius of curvature the part within the anterior chamber with its centre at A. As the blade is being brought up to C, the shank is gradually withdrawn until when the upper limit of the cut is reached practically only the blade remains within the anterior chamber. Were it not for this manœuvre the blade would sink dangerously deep into the lens or possibly dislocate it. The knife handle is now



RIGHT EYE

given a quarter turn toward the operator, thus bringing the cutting surface of the blade toward the lens in its next position and carried over to D. Again is described an arc with the handle, but this time toward the operator, and a cut is made at right angles to the first, ending at E. As in the first instance, the shank is partly withdrawn as the cut approaches its end. The blade is now turned into the plane of its entrance and the knife removed from the eye. If for the left eye, the operator stands on the left side of the patient and the knife is introduced in the infero-temporal quadrant. The cut then begins from above, but with these two exceptions the procedure is the same. The eye is then flushed with the antiseptic lotion, the conjunctival sac filled with a 1:3000 bichloride ointment, an occlusive bandage applied, the patient

put to bed, and a fourth grain of morphia is given. On the following morning the bandage is removed, the technique of asepsis again gone through with, and the extraction proper is performed. This does not differ from the usual method, but the corneal section should be ample as immature cataractous lenses have large nuclei. To those who may urge an added danger of infection it may be answered that so far there has been none. Immature cataracts do not make up the larger proportion of the cases operated upon, but in a series of thirty such the results have been satisfactory. The number is not large but sufficiently so to draw some definite conclusions therefrom. There have been no total failures and vision has ranged from $\frac{20}{70}$ to $\frac{20}{15}$.

The disadvantages of a preliminary capsulotomy may be summed up in a sentence. It requires more time and trouble as the technique of asepsis must twice be gone over. The disadvantages of the ordinary capsulotomy are so many that they will be gone over in detail and in comparison with this method. First as to the instrument itself. The straight capsulotome is kept sharp with difficulty and cuts only when drawn toward the operator; at right angles to this it simply scratches. As soon as the section is made, the anterior chamber is abolished, the iris contracts, and the lens comes forward. Into this narrow space must be passed between cornea and lens a straight instrument; it is impossible with this to reach with its cutting edge a point much removed from the anterior pole of the lens unless the latter be pushed backward, and at this stage the lens held only by its suspensory ligament is mobile and easily dislocated. More than this the operator in his zeal to make an efficient capsulotomy is apt to rupture this ligament and loss of vitreous ensues. There are no means of knowing that the capsulotomy has been inadequately performed until the lens, when pressure is applied to the globe, refuses to come forward. In this event there only remains the reintroduction of the cystotome without the help of the fixation forceps, trusting to the patient's own control of the eye. The pupillary space being narrowed by the contraction of the iris leaves insufficient room in which to work, and it is a difficult matter not to wound the iris or entangle it in the tip of the instrument. If the bent cystotome be used then

are these difficulties enhanced, and not only are there greater difficulties in removing fragments of cortex, but a peripheric capsulotomy leaves two thicknesses of lens capsule in the pupillary space and more often is required a secondary operation. Should blood enter the anterior chamber then are the difficulties before mentioned still further increased.

Every one of these difficulties is obviated by a preliminary capsulotomy. (1) The capsulotomy knife can be made superlatively sharp and efficiently cuts the capsule in both directions. (2) Ample space is given through the dilated pupil, and the point of the knife may be kept fully in view during the division of the capsule and, furthermore, the operator has the satisfaction of knowing that this is perfectly performed. (3) Only through the grossest carelessness can the suspensory ligament be ruptured or the lens dislocated, for it is held firmly in place by the pressure of the vitreous behind and the aqueous in front. (4) The iris cannot be wounded or entangled in the instrument and there can be no bleeding to obscure the view of the operative field. These comparisons present with fairness to both procedures their relative merits. What now can be said in favor of the method of waiting overnight before doing the extraction proper? One may be perhaps forgiven if he is enthusiastic over his own discovery, even though it was reached by accident.

When one has seen many times at the hands of good operators mushy extractions, sticky lenses, with frequent loss of vitreous, and has almost entirely escaped these himself; when one has seen immature lenses delivered round and whole without leaving cortex behind, when one, without claiming special skill, expects and gets this delivery with hardly any pressure on the globe, one naturally gives the method credit and not the operator. More than this, if further proof be necessary, almost never is there required a secondary operation, which most surely would be the case if cortex was left behind. It makes an immature cataract operable at once and saves the patient much weary waiting and loss of usefulness. In conclusion I can only emphasize what has been already said. The procedure is safe, efficient, and easy of execution. It is adapted to all types of cortical cataracts, but particularly is it of value in the immature variety. It makes the capsulotomy the easiest step in the extraction and greatly facilitates the delivery of the lens.

NOGUCHI'S CUTANEOUS LUETIN REACTION AND ITS APPLICATION IN OPHTHALMOLOGY[1]

By MARTIN COHEN, M.D., New York.

OWING to the complexity and non-specificity of the Wassermann reaction and its modifications, a simple clinical means of detecting latent syphilis would be valuable. Working on theories borrowed by Von Pirquet in the discovery of the cutaneous tuberculin reaction, Noguchi has employed a theoretically analogous method as a test for syphilis, obtaining therewith results which are likely to prove of great significance and value in the practical diagnosis of syphilis in the future. Obviously such an advance would be impossible but for Noguchi's recent discovery that spirochætæ pallidæ can be grown in pure culture.[2]

The material used in our own studies was prepared by Dr. Noguchi at the Rockefeller Institute for Medical Research. The method of preparation of an emulsion of killed pure cultures of spirochætæ pallidæ and a control medium has recently been published.[3]

This test emulsion, which Noguchi has named *luetin*, is an emulsion or extract of the cultivated pure spirochætæ pallidæ which have been killed by heat and then carbolized with ½% phenol. The control emulsion consists of the uninoculated culture media, prepared in the same way as the luetin media.

The technique is simple. Under aseptic precautions the control emulsion is injected intradermatically on the antero-

---

[1] Read at meeting of the Section on Ophthalmology, N. Y. Academy of Medicine, Nov. 20, 1911.

[2] *Journal of Experimental Medicine*, August, 1911.

[3] "A Cutaneous Reaction in Syphilis," by Hideyo Noguchi, M.D., *Journal of Experimental Medicine*, December, 1911.

internal aspect of one arm or forearm; the luetin emulsion is similarly injected at a corresponding site on the opposite extremity. The emulsion having been drawn into the hypodermatic syringe connected with a fine, sharp needle, the skin at the chosen site is pinched up with cleansed fingers, the epidermis is punctured with the point of the needle and, as the tension of the skin is released by withdrawing the fingers, a drop of the emulsion is injected into the skin. There should result a tiny, white, infiltrated area about *2mm* in diameter, this pale swelling disappearing in about fifteen minutes. The control emulsion is injected on one side, the luetin on the other. The inoculated areas are left undisturbed and observed at frequent intervals thereafter.

In *non-luetic cases* the results of inoculation are as follows: On both the luetin and control sites there is no inflammatory reaction except sometimes a tiny trauma or ecchymotic area due to the needle, and an erythematous halo which disappears within forty-eight hours. In *luetic cases:* at the site of the luetin inoculation a very distinct series of characteristic changes are observed. There first appears, usually in from six to twenty-four hours, though sometimes considerably later, occasionally even as late as eight days, a distinct papule surrounded by a bluish-red halo. As the papule increases in size and prominence, the areola gradually fades. This papule, which is circular or elliptical and from 5 to *20mm* in diameter, develops in the majority of cases a central area of suppuration, at which rupture occurs after several days. As the discharge of the sero-purulent fluid occurs, there is denudation of the contiguous epidermis. Epidermatization now begins and a hypertrophic condition of the affected skin supervenes. In cases with marked reactions this hypertrophy persists, the period of observation having been five months. It might be mentioned that smears and cultures of the suppurating focus were found to be bacteriologically negative by Dr. Noguchi. Microscopic examination of sections of the hypertrophied area showed round-cell infiltration.

At the site of the *control* inoculation in luetic individuals there is generally no reaction; in a small number of the cases, however, the appearances and changes resemble the positive luetin reaction, with the exception that there follows merely

a discoloration of the skin instead of a marked persistent hypertrophy.

It is usually individuals suffering from tertiary syphilis who exhibit this pseudo-reaction with the control emulsion, and it is assumed that in those cases there exists the peculiar pathological condition of the skin spoken of by Neisser as "Umstimmung," in which case there is increased susceptibility to trauma.

Usually there is no constitutional reaction; in two positive cases, however, on the day following the inoculation there were malaise, slight temperature elevation, and mild gastro-intestinal disturbance.

Since it is frequently important, though difficult, to discover the exact etiology in certain diseases of the eye, in which syphilis as a causative factor is suspected, I undertook a series of investigations with the hope of ascertaining the value of the luetin test in ophthalmological practice. To be convinced of the negative value of this test, Dr. Noguchi and I first performed it on fifty non-syphilitical individuals with minor ailments; absolutely negative were 47 out of these 50 tests. In three cases there were mild and evanescent reactions with the luetin emulsion, and negative controls; the reactions were atypical in that the papule was small and faint-colored and entirely disappeared in less than two weeks without the usual hypertrophy; the Wassermann reaction was negative in these three cases.[1]

In ten out of twelve cases of proved pulmonary tuberculosis two gave a positive luetin test and negative controls, but also a positive Wassermann reaction; one of these two patients gave a history of syphilis. Of six individuals convalescent from proved malaria, one revealed a positive luetin test, but also a positive Wassermann reaction. The test was negative in five patients convalescent from typhoid fever.

After obtaining these negative results in healthy individuals and also in patients suffering from some of the infectious diseases, a study was begun of the luetin test in sixty ophthalmological cases, patients at the New York Ophthalmic and

[1] Since submitting this article for publication, I have found the test uniformly negative in twenty additional non-syphilitic patients suffering from various minor ailments.

Aural Institute. In every case studied, the Noguchi modification of the Wassermann reaction was performed by Mr. Bronfonbrenner at the Rockefeller Institute. There is appended a tabulation of all the eye conditions studied. Brief descriptions of illustrative cases follow:

Interstitial keratitis.—A boy, 14 years of age, whose mother had two miscarriages previous to his birth, suffered from exacerbations of the eye condition for five years and from time to time received mixed treatment. In the mother the Wassermann and cutaneous tests were both positive. In the patient the Wassermann was negative, but the cutaneous test positive.

Interstitial keratitis.—A boy, 9 years of age, has had this disease for two years; his mother had two miscarriages previous to the birth of a daughter 16 years ago. The Wassermann and cutaneous tests were positive four months ago in the mother as well as the daughter, the latter also having suffered for four years with exacerbations of interstitial keratitis. In the boy the Wassermann was positive four months ago and six weeks ago, while at both these times the cutaneous reaction was negative. Recently deafness developed in both ears, and there has been a severe exacerbation of the disease.

Possibly the failure to obtain positive luetin tests in this case might be explained by the overwhelming virulence of the affection preventing the usual formation of anaphylactic principles.

Acute iritis.—Married man, 32 years of age, infected with syphilis one year and a half ago. Treated for one year. Wassermann and cutaneous tests positive.

Acute iridocyclitis, unilateral.—A man, 29 years of age, had a chancre seven months ago, followed by secondary manifestations. Treated with six intramuscular injections of salvarsan, each 0.3*gr*. Despite the treatment eye symptoms appeared two months ago. Wassermann negative, cutaneous reaction positive.

Abducens paralysis.—Patient of Dr. Philip Grausman, 40 years of age, acquired syphilis three years ago, and has been energetically treated with injections of salicylate of mercury since then. Diplopia developed three months ago. Wassermann negative. Cutaneous reaction positive. Eye condition has improved greatly since salvarsan was administered and mercury readministered.

Ophthalmoplegia externa.—A man, 50 years of age, denies syphilis and gives no other clinical evidence of the disease than partial oculomotor paralysis. Wassermann negative. Cutaneous test positive. Practical cure of eye condition followed two months of mixed treatment.

Optic atrophy, primary bilateral.—An alcoholist, 48 years of age, contracted syphilis fifteen years ago, and was treated only for a year and a half with inunctions and potassium iodide. Disturbance in vision first noted six months ago. Physical examination showed cardinal signs of tabes. Wassermann and cutaneous reaction both positive.

Orbital tumor.—Dr. Arnold Knapp's patient, a married woman, 31 years of age, gave neither a history nor clinical evidence of syphilis. Antisyphilitic remedies had no effect on the unilateral exophthalmos, orbital periostitis, ocular paralysis, and keratitis from lagophthalmos. Wassermann negative, cutaneous reaction negative. Following the Krönlein operation performed by Dr. Knapp, examination of the specimen showed the tumor to be a fibro-endothelioma.

Stenosis of lachrymal canal.—A married woman, 43 years of age, treated for syphilis twenty years ago, with inunctions and potassium iodide, has complained of epiphora during the past six months. Small lachrymal probe failed to enter canal. Wassermann reaction positive. A positive cutaneous reaction was followed the next day by malaise, with temperature of 100.3°F., and gastro-intestinal disturbance.

Choroiditis, chronic exudative.—Four patients under the care of Dr. Irvin Török all reacted positively with diagnostic tuberculin. All gave negative Wassermann and negative cutaneous reactions. Another patient of Dr. Török's with chorio-retinitis had contracted syphilis fifteen years ago and had afterwards been treated with inunctions and potassium iodide. There was a decided general reaction to tuberculin: the Wassermann was negative, but the luetin test was strongly positive.

In attempting to determine the practical value of the luetin reaction, I investigated in every case the correspondence or non-correspondence of the test, first with the clinical evidence of syphilis, and second with the result of the Wassermann reaction. Accordingly, analysis of the results depended upon:

A. Agreement of the cutaneous test with both clinical evidence and Wassermann reaction.

B. Disagreement of the cutaneous test with both clinical evidence and Wassermann reaction.

C. Agreement of the cutaneous test with either one of the two factors of comparison, but disagreement with the other one.

+ = positive, — = negative.

A { I. Cutan. test +, clin. evid. +, Wasserm. +, 12 cases
  { II. Cutan. test —, clin. evid. —, Wasserm. —, 16 "

28 cases

B { I. Cutan. test +, clin. evid. —, Wasserm. —, 3 cases
  { II. Cutan. test —, clin. evid. +, Wasserm. +, 11 "

14 "

C { I. Cutan. test +, clin. evid. +, Wasserm. —, 2 cases
  { II. Cutan. test +, clin. evid. —, Wasserm. +, 6 "
  { III. Cutan. test —, clin. evid. —, Wasserm. +, 7 "
  { IV. Cutan. test —, clin. evid. +, Wasserm. —, 3 "

18 "

60 cases

From the above tabulation it will be seen that:

Cutaneous reaction corresponded with both clinical evidence and Wassermann in..... 28 cases

Cutaneous reaction corresponded with clinical evidence alone in..... 9 "

Cutaneous reaction corresponded with Wassermann alone in..... 9 "

46 cases

Cutaneous reaction did not correspond with both clinical evidence and Wassermann in..... 14 "

Therefore, in 46 out of 60 cases, or 76⅔ %, the cutaneous reaction corresponded either with clinical evidence and Wassermann together or with one of them separately; and in 14 out of 60 cases, or 23 ½%, the cutaneous test did not correspond with clinical evidence and Wassermann together.

It must be borne in mind that these fourteen cases which did not correspond with the clinical manifestations and Wassermann reaction fall under two distinct categories; namely, the one in which, despite the old infection of syphilis,

the clinical and serological evidences of syphilis could not be found at the time of making the luetin reaction. These belong principally to latent cases of syphilis where a detection of the persistent dormant infection is most desired and yet difficult; and the other, in which the activity of syphilitic processes is so strong that the patient's organism is incapable of acquiring the anaphylactic condition of the skin—hence no reaction to the luetin test. Therefore the non-correspondence of the luetin reaction with the clinical and serological conditions does not necessarily mean the absence of a syphilitic infection in these cases.

Summary and Conclusions.—The luetin test, which is performed by injecting intradermatically a sterile emulsion containing killed spirochætæ pallidæ obtained from pure culture, will probably prove to be a valuable aid in the diagnosis of syphilis.

Thus far the test has been absolutely harmless in 170 cases which were inoculated during the past five months.

There having been no reactions in 94% of cases considered non-syphilitic, and only mild and atypical reactions in the remaining 6%, the test appears to be of considerable negative value.

In 76⅔ % of the ophthalmological cases in which the test was performed, it conformed either with the clinical evidence and Wassermann reaction together or with one of these factors of comparison separately. It may, therefore, be concluded that, even in the present experimental stage of the study of the luetin test, a positive reaction is strong presumptive evidence of the existence of syphillis. It is anticipated that with more active luetin and improvement in its method of preparation the above-mentioned percentage-conformity will be much higher.

The luetin test was positive in ten cases regarded clinically as syphilitic in which, presumably because of previous anti-syphilitic treatment, the Wassermann was negative.

Name of Disease	No. of Cases	Clinical Manifestations +	Clinical Manifestations −	Recently Treated	Not Recently Treated	Wassermann +	Wassermann −	Cutaneous Reaction +	Cutaneous Reaction −	
1. Interstitial Keratitis	20	12	8	12	8	12	8	11	9	
2. Kerato-iritis	3	0	3	1	2	2	1	2	1	
3. Keratitis marg. profunda	1	0	1	0	1	0	1	1	1	
4. Keratitis neuro-paralytica	1	0	1	0	1	0	1	0	0	
5. Keratitis disciformis	1	0	1	0	1	1	0	0	1	
6. Acute Iritis	4	3	1	2	2	2	2	4	0	
7. Irido-cyclitis (acute)	3	1	2	2	1	1	2	2	1	
8. Irido-choroiditis	1	1	0	0	1	1	0	1	0	
9. Choroiditis exud. (acute)	1	0	1	0	1	0	1	1	0	
10. Iritis serosa	1	0	1	0	1	0	1	0	1	
11. Scleritis	1	0	1	0	1	0	1	0	1	
12. Optic Neuritis	3	2	1	1	2	0	3	3	0	
13. Opt. Atrophy (prim. 3, sec. 2)	5	1	4	1	4	5	0	4	1	
14. Chorio-retinitis	1	1	0	1	0	0	1	1	0	T. B. C. test +
15. Retinitis proliferans	2	0	2	0	2	0	2	0	2	T. B. C. test +
16. Detachm. of Retina	1	0	1	0	1	0	1	0	1	T. B. C. test +
17. Detachm. of Retina (traumatic)	1	0	1	0	1	0	1	0	1	
18. Retinitis prolif. (traumatic)	1	0	1	0	1	0	1	0	1	
19. Macular Choroiditis	1	0	1	0	1	0	1	0	1	
20. Abducens Paralysis	2	2	0	2	0	1	1	2	0	
21. Ophthalmopl. externa	1	0	1	0	1	0	1	1	0	
22. Thrombosis, cent. art. inf. br.	1	0	1	0	1	0	1	0	1	
23. Anisocoria	1	0	1	0	1	1	0	1	0	
24. Stenosis Lachr. Canal	1	1	0	1	0	1	0	1	0	
25. Puls. Exophthalmos (idiop.)	1	0	1	0	1	1	0	1	0	
26. Orbital Tumor	1	0	1	1	0	0	1	0	1	
	60	24	36	24	36	28	32	36	24	

DETAILED REPORT ON 358 CATARACT EXTRACTIONS PERFORMED AT JULLUNDUR, PUNJAB, INDIA, IN OCTOBER, 1909, AT COL. HENRY SMITH'S CLINIC; WITH COMPLETE STATISTICAL TABLES.

By DERRICK T. VAIL, M.D., Cincinnati, Ohio, U. S. A.

(*With three folding charts.*)

So much has been written *pro* and *con* concerning the actual results of Colonel Smith's operation for cataract, that I felt it was my duty to publish a tabulated report on the cases I actually did while a visitor at the Jullundur Hospital operating under Smith's supervision and strictly according to his own method.

At the onset I wish to state, and it is a pleasure to do this, that had I interjected any of my own ideas and preconceived notions as to how the intracapsular extraction of cataract should be performed, opinions based on ample teaching and a wide experience with the "old operation," no such brilliant results could have been possible. Credit for this remarkable run of successful operations belongs to Smith and, as I just remarked, it is a pleasure for me to acknowledge this fact. I was invited by Smith to operate the day I arrived, but I refused, saying I did not come to exhibit my own methods, but to learn his, and I begged the privilege of seeing many operations before beginning on my own account.

I wished to satisfy my own mind as to the following points before I would engage in so important an undertaking as cutting open the eye to deliver the unbroken lens, a feat which concerned the welfare and happiness of even those poor, wretched, and apparently indifferent and inconsequential people.

1st. As to the section—how did Smith do it?

2d. As to the delivery of the lens in its capsule—what were his methods and how did he actually proceed?

3d. As to the replacement of the iris—what were his methods and their advantages?

As to these points and many others, I have written a full and detailed account (*Lancet-Clinic*, Cincinnati, January 7 and 14, 1911), a reprint of which I will gladly mail free of charge to any one sending his address to me.

Having learned by close observation, much thought, and free discussion as to the purposes and intents of each step of Smith's operation, and having gained the advantages of Smith's instructions and demonstrations through many operations done by himself and others, I felt that I could safely undertake it.

I arrived at Jullundur September 27, 1909, and did my first operation October 14th; thus I spent seventeen days in study and observation before I began the work on my own account. I offer this explanation that those who read this may understand my remarkable success in this series of 358 extractions.

In the appended table I have accounted for every case I did there, for I have carefully compiled every record as it was actually made, using the original "Bed-head Tickets" and the record book as kept at Jullundur by the clerks in the administration office there. I regret that the bed-head tickets of forty cases were lost, some being carried away, I was told, by the patients upon leaving the hospital, and many mislaid in the confusion incident to moving from the old Jullundur Hospital to the new Victoria Memorial Hospital on October 25, 1909. I have, however, the complete record of all the cases as recorded in the clerk's official book on all operated cases (general operations as well as eye operations of all kinds), and from them I am able to report concerning all the cases, though incomplete as regards the forty cases above referred to.

In order that it may be known what kind of record was kept in each case, I herewith submit a *facsimile* of one taken from my files at random. See next page.

BED-HEAD TICKET.

DISPENSARY Jail

Register No. 3366	Date of Discharge 6/11/07
Name Jiwa	Condition on admission —
Father's Name Lachmi	Conjunctiva —
Age 50	Iris —
Caste M	Lens —
Sex M	Cornea —
Occupation Ghoman	Operation—Complication nil
Residence Bakhlaur	~~Capsulotomy~~
Police station Rahon	In-capsule
District Jullundur	Vitreous escape nil
Disease Cataract D	Iridectomy Yes
Duration 2 y	Result, vision, good, ~~poor~~, Nil
Date of admission 26/10/07	Vail

Previous history and present state.

Date and month.	Daily particulars.	Treatment.	Diet.
29/10/07	First dressing O.D. Eyes quiet —	Eserine weak drop	Ordinary
1-11	Eyes quiet and healed		

(If necessary continue on back)

3-11-07

The ticket here submitted is an average one in the sense that some of the tickets contain more data and some less than the one here shown. It may therefore be considered a fair sample of the kind of record which was kept in each case in that busy hospital, where as many as 127 operations of all kinds were performed in a single day (see *Ophthalmic Record*, Feb., 1910, The "Jullundur Patient," by the author).

Concerning the average age of my cases:

The following table is interesting, as it contains a report on the average age of the East India cataract patient. It must be remembered, however, that as many of the patients were operated upon for immature cataract, the average age here shown (50.3 years) is somewhat lower than if figured on a basis of mature cataract alone. In European and American statistics only mature cataract enters into the figuration.

TABLE I

Showing number of cataract patients, number of cataract operations done by me, and average age.

Date	Patients	Extractions	Average Age
Oct. 14, 1909	4	7	55.000 years
Oct. 15, 1909	4	6	55.000 "
Oct. 16, 1909	6	11	50.666 "
Oct. 17, 1909	4	8	53.750 "
Oct. 18, 1909	17	26	55.294 "
Oct. 19, 1909	18	33	50.039 "
Oct. 20, 1909	17	28	49.294 "
Oct. 22, 1909	13	22	48.077 "
Oct. 23, 1909	16	27	51.938 "
Oct. 24, 1909	10	17	49.600 "
Oct. 26, 1909	25	40	49.880 "
Oct. 27, 1909	16	28	41.687 "
Oct. 28, 1909	26	42	50.423 "
Oct. 29, 1909	15	23	51.133 "
Oct. 30, 1909	15	23	51.333 "
Oct. 31, 1909	13	17	51.462 "
16 days	219 patients	358 cataracts	50.365 years average age

The 219 patients totalled 11,030 years or 50.365 years per patient.

Concerning vitreous escape:

I kept a careful record of all cases of vitreous escape. Vitreous escape is invariably recorded at once in all cases at the moment the operation is completed. The following is a table showing all the cases of vitreous escape recorded against me in my series of 358 extractions.

TABLE II. VITREOUS ESCAPE

Case No.	26—Right Eye	45th	operation	of	the	series.	
" "	46—Both Eyes	79th & 80th	"	"	"	"	
" "	68—Left Eye	116th	"	"	"	"	
" "	107—Left Eye	182d	"	"	"	"	
" "	114—Right Eye	192d	"	"	"	"	
" "	201—Right Eye	333d	"	"	"	"	

There were 358 consecutive extractions done by me with seven (7) vitreous escapes in all, an average of .0195 or *less than 2%*.

In publishing this table I am aware that my veracity will be impugned in some quarters. That will not alter the facts, however. The above table is correct. There were but seven cases in all in which any vitreous was lost and in each of these seven only a small amount escaped. I did all my operations in Smith's presence and no doubt his timely advice at critical moments helped greatly in keeping my score clean.

In no case did Smith take the instruments from my hands to complete a badly begun operation. None of the cases were complicated with other disease, such as glaucoma, etc., but they represent all kinds of uncomplicated cataract from immature to Morgagnian. My best score was from operation No. 192 to operation No. 333, an interval of 141 consecutive extractions without a vitreous loss!

TABLE III

Showing the "double" and "single" extractions performed and the dates on which they were done.

Date	Doubles	Cataracts	Singles	Total
Oct. 14, 1909	3	6	1	7 extractions
Oct. 15, 1909	2	4	2	6 "
Oct. 16, 1909	5	10	1	11 "
Oct. 17, 1909	4	8	0	8 "
Oct. 18, 1909	9	18	8	26 "
Oct. 19, 1909	15	30	3	33 "
Oct. 20, 1909	11	22	6	28 "
Oct. 22, 1909	9	18	4	22 "
Oct. 23, 1909	11	22	5	27 "
Oct. 24, 1909	7	14	3	17 "
Oct. 26, 1909	15	30	10	40 "
Oct. 27, 1909	12	24	4	28 "
Oct. 28, 1909	16	32	10	42 "
Oct. 29, 1909	8	16	7	23 "
Oct. 30, 1909	8	16	7	23 "
Oct. 31, 1909	4	8	9	17 "

Total, 139 doubles, making 278 extractions, plus 80 singles =358 in all.

TABLE IV

Showing caste of patients operated on; also sex and average age respectively.

Hindus	Male 74	doubles 47 = 94 singles 27	total 121, average age 52.81 yrs.
	Female 36	doubles 26 = 52 singles 10	total 62, average age 48.71 yrs.
Mohammedans	Male 51	doubles 31 = 62 singles 20	total 82, average age 50.49 yrs.
	Female 38	doubles 28 = 56 singles 10	total 66, average age 47.66 yrs.
Low Castes	Male 15	doubles 9 = 18 singles 6	total 24, average age 49.67 yrs.
	Female 2	doubles 1 = 2 singles 1	total 3, average age 43.00 yrs.

"Double" Extractions	142	=284
"Single" "		74
Total		358

Hindus	183	extractions	male	and	female
Mohammedans	148	"	"	"	"
Low Castes	27	"	"	"	"
Total	358	"	"	"	"

Average age 50.36 years (see Table I.).

TABLE V

Showing the number of days the first dressing remained.

There were 124 records made on the bed tickets as to when the first dressing was changed. The following is the report:

First dressing changed in two days	2
" " " " three "	102
" " " " four "	12
" " " " five "	2
" " " " six "	6
	124

From this we note that it was the habit of the dresser to remove the bandages and inspect the eye, as a rule, on the third day.

This seemed necessary, partly because the dressing usually became loosened and had to be refreshed.

TABLE VI

Showing on what days the patients left the hospital after operation.

1	patient	left	on	the	4th day } without permission.
9	patients	"	"	"	5th " }
27	"	"	"	"	6th "
44	"	"	"	"	7th "
43	"	"	"	"	8th "

21	patients	left	on	the	9th	day
8	"	"	"	"	10th	"
14	"	"	"	"	11th	"
8	"	"	"	"	12th	"
1	patient	"	"	"	19th	"

The 176 patients above accounted for represented 304 cataracts, many of them being "double" operations.

Average number of days in the hospital for each, *eight.*

It should be remembered that the stay of patients was made shorter than usual because of the great number of new cases coming in and the lack of sufficient accommodation.

As regards visual results:

The result was entered as "good" when upon leaving the hospital it was found that the patient could "see good" with the eye operated upon and that the cornea was clear and the wound closed. The records herewith published show 294 operations fully accounted for. The results in 64 operations were unaccounted for because the original bed tickets were lost or carried away by the patients when they left.

Of these 294 operations, there were 286 unquestionably "good" as regards visual results, as estimated by the above standard. Among eight cases the results recorded were as follows:

TABLE VII

fair	vision.....	1
hazy	"	1
dim	"	1
poor	"	2
doubtful	"	1
bad	"	1
nil	"	1
		8

Thus the percentage of "good" vision, as estimated by this standard, was a little better than 97%.

It is granted that the actual results of operation should be

determined three months after the operation. For manifest reasons it is impossible to get the vision at the time the patient leaves the hospital, but if the cornea is bright, the eye sensitive to the light, and the patient declares he can see well, it is entered as "good" on the bed-head ticket.

The results as recorded on the "bed tickets" were entered by the native assistant surgeon, Dr. Diwanali, who is a thoroughly competent and experienced cataract operator himself. Smith made the record of each operation at the moment of its completion and after that only examined such cases as were reported by the assistant as not doing well.

Smith takes the responsibility all on himself. He never censures his assistants or abuses them over cases which go wrong. They report the complication to him at once and he instructs them what to do. By this courteous treatment of the timid East Indian M.D., he (the Indian) has no object in concealing facts from his master. Smith is well known as a genius in dealing with the natives of the East.

The daily record of the progress of the case was made by the assistant, who was trained to make truthful records. Smith did not often see the result of the operation when the patient was permitted to leave the hospital, but when he returned in a month or six weeks to secure his glasses, Smith would carefully examine him.

I have no records showing the ultimate results in any of these cases. The results here published are those noted by Diwanali on the day the patient departed, which, as Table VI shows, averaged the eighth day following the operation.

I left Jullundur satisfied that I had witnessed and performed the most remarkable and brilliant series of cataract operations that I had ever, in my own experience, observed.

The reader is referred to the detailed report of all cases operated on by me. This table is published on the following inserted sheets:

TABLE · OF · CATARACT · CASES · OPERATED · ON · AT · JULLUNDUR · INDIA · IN · SMITHS · Clinic · By · D.T. VAIL. · Oct. 1909.

NO.	Register	ENTRANCE DATE	NAME	AGE	Caste	Sex	Occupation	Cataract	Duration	DATE Operation	DATE Discharge	IRIS.	LENS	CORNEA	Operation Complication	VITREOUS ESCAPE	IRIDECTOMY	EYE DRESSED	DAILY Particulars & Treatment	VISION RESULT	Remarks.
1	3050	14·10·09	Buta	50	O	M	Sweeper	Double	2 yrs.	14·10·09	26·10·09				nil	nil	yes	3 days	Wound Gaping - Leeches	GOOD	
2	3051	14·10·09	Pala	60	H	M	Cultr	Double	2 yrs	14·10·09	26·10·09				nil	nil	yes	3 days	No trouble -	Good	
3	3052	14·10·09	Gobinda	60	H	M	Carpenter	Double	2 yrs	14·10·09	26·10·09				nil	nil	yes	3 days	Eyes quiet - Slow healing	GOOD	Immature
4	3053	14·10·09	Basra	50	H	M	Culti	Left	2 yrs	14·10·09	26·10·09	Nicks	Blind		nil	nil	Yes	3 days.	Pretty thin Wound healed Late	GOOD	Immature
—	Summary - Oct 14 1909 - 4 Extractions - 2 of them "pressed" one "pumped" no nitrous Escape - no capsule burst. all extracted in capsule - all left in 12 days -																				Oct 14 4 Extractions
5	3064	15·10·09	Dulla	60	H	M		Right		15·10·09						nil					
6	3065	15·10·09	Chhanga	40	H	M		Double		15·10·09			Imm			nil					Immature
7	3066	15·10·09	Maya	60	H	M	Culti	Double	2 yrs	15·10·09	26·10·09		L. Imm		nil	nil	yes	3 days	R. clear L. Slightly hazy.	GOOD	L. Immature
8	3067	15·10·09	Kamy Shah	60	M	M	Fakir	Left		15·10·09	26·10·09		Imm		nil	nil	yes	4 days	Eye slightly irritable -	GOOD	Immature
—	Summary Oct 15 1909 - 6 Extractions - one "burned" two capsule burst but Wire secured. # 3064 required Spoon, delivery no nitrous																				Oct 15 - 6 cases.
9	3077	16·10·09	Bholi	40	H.	F.	Culti	Double	2 yrs	16·10·09	26·10·09				nil	nil	yes	3 days	Much redness both Eyes	GOOD	
10	3078	16·10·09	Badhawa	54	H	M.		Double		16·10·09						nil					
11	3079	16·10·09	Rupan	60	H	F.	Culli	Double	2 yrs	16·10·09	23·10·09				nil	nil	yes	3 days.	R. good L. Cornea Sloughed	R. Good L. Bad.	
12	3080	16·10·09	Mela	54	H.	M.	Sister Relation	Double	2 yrs	16·10·09	27·10·09				nil	nil	yes	2 days	both eyes good	GOOD	
13	3081	16·10·09	Bhan Singh	56	H.	M	Sepoy 8th	Double	2 yrs	16·10·09	26·10·09				nil	nil	yes	2 days	Eyes quiet -	GOOD	
14	3083	16·10·09	Mehal Singh	40	H	M	Culli	Left	2 yrs	16·10·09	23·10·09				nil	nil	yes	3 days	Eye good -	GOOD	
—	Summary + notes: 11 Extractions today. no nitrous - no capsule burst. one turned. 2 cases had Blephoroplasty made from tredona. In one it was impossible to																				Oct 16.
	insert the Speculum. all but one was immature - one mature (Rt "turned") - all incisions are done entirely in the cornea -																				11 cases.
15	3090	17·10·09	Choren	70	H	F.		Double		17·10·09						nil					Immature
16	3091	17·10·09	Dharmon	40	H	M.		Double		17·10·09			Im			nil					
17	3092	17·10·09	Panjaba	45	H.	M		Double		17·10·09						nil					
18	3093	17·10·09	Hazara Singh	60	H	M		Double		17·10·09			Im.			nil					Immature
—	Summary + notes: 8 Extractions today. 3 Each immature one small flat Lenses - no nitrous escape - (Bed-head charts not secured)																				Oct. 17: 8 cases.
19	3106	18·10·09	Mehra	50	H	M.	Bhisti	Double	2 yrs	18·10·09	27·10·09		Im.		nil	nil	yes			GOOD	
20	3107	18·10·09	Rode Shah	50	M	M.	Fakir	Double	2 yrs	18·10·09	27·10·09				nil	nil	yes	4 days	Eyes quiet	GOOD	
21	3108	18·10·09	Manglan	56	H.	M.	Carpenter	Double	2 yrs	18·10·09	26·10·09				Capsule Burst	nil	yes		good vision	GOOD	
22	3110	18·10·09	Buta	60	O	M	Cham.	Double	2 yrs	18·10·09	26·10·09				nil	nil	yes	4 days	Eyes quiet - no trouble	GOOD	
23	3111	18·10·09	Khazana	60	H	M.	Culti	Right	2 yrs	18·10·09	26·10·09		Im.		nil	nil	yes	3 days	" " " "	GOOD	
24	3112	18·10·09	Narain	60	H	M.		Left		18·10·09						nil					
25	3113	18·10·09	Tara	50	M	M.		Right		18·10·09						nil					
26	3114	18·10·09	Ganda Singh	56	H	M	Sukha	Double	2 yrs	18·10·09	26·10·09				R.E. Vit	Right adhesion. Yes.		3 days	Eye slightly red	GOOD	
27	3115	18·10·09	Kala Singh	56	H	M.		Double		18·10·09						nil					
28	3116	18·10·09	Bishan Das	40	H	F.	Carpenter	Double	2 yrs	18·10·09	26·10·09				nil	nil	yes	3 days	Eyes good.	GOOD.	Vail did R.E.
29	3117	18·10·09	Ulam Singh	60	H	M	Culti	Right	2 yrs	18·10·09	26·10·09				nil	nil	yes	3 days	Eye slightly red -	GOOD	
30	3118	18·10·09	Mangal Singh	56	H	M.	Culti	Double	2 yrs	18·10·09	25·11·09				nil	nil	yes	3 days	Both Eyes quiet	GOOD.	
31	3119	18·10·09	Asa Singh	56	H	M.	" "	Right	2 yrs	18·10·09	26·10·09				nil	nil	yes	3 days	Eye quiet - no trouble	GOOD	
32	3120	18·10·09	Bholi	40	H	F.	" "	Right	2 yrs	18·10·09	30·10·09				nil	nil	yes			GOOD	
33	3121	18·10·09	Jeman	45	M.	F.	" "	Double	2 yrs	18·10·09	26·10·09		R. im.		nil	nil	yes	3 days	Redness. both Eyes -	GOOD	
34	3122	18·10·09	Phern	70	H	M.	Sonar	Double	2 yrs	18·10·09	26·10·09		R. im.		nil	nil	yes	3 days	Eyes quiet -	GOOD	
35	3124	18·10·09	Abdulla	75	H	M		Right		18·10·09											
—	Summary + notes: 26 Extractions today - one nitrous case - Small amount escaped - many were hard to move - a few turned over - one capsule burst in the lot.																				Oct 18·09 26 Cases
36	3143	19·10·09	Bano	40	H	F.	Lahary	Double	2 yrs	19·10·09	26·10·09				nil	nil	yes	3 days	Eyes good -	GOOD	
37	3144	19·10·09	Jioni	40	H	F.	Culti	Double	2 yrs	19·10·09	26·10·09		R. im.		nil	nil	yes	3 days.	R.E. good L.E. Hagg. Blue Mem.	GOOD	Both Eyes Good
38	3145	19·10·09	Iman Bibi	56	M.	F.	Shakh	Double	2 yrs	19·10·09	1-11-09		L. im.		nil	nil	yes	3 days	Eyes good. - Eserine -	GOOD	
39	3146	19·10·09	Malan	56	H	F.	Culti	Double	2 yrs	19·10·09	27·10·09				nil	nil	yes	3 days	Eyes good - Cornea clear	GOOD	
40	3147	19·10·09	Mehri	30	M.	F.	Salahi	Double	2 yrs	19·10·09	27·10·09				nil	nil	yes	3 days	R.E. good L.E. Wound not good	GOOD	vision R. & L. Good
41	3148	19·10·09	Dhan	50	H	F.	Culti	Double	2 yrs	19·10·09	26·10·09				nil	nil	yes	3 days	Eyes very red. cornea clear	GOOD	no pain.
42	3150	19. 10.09	Rukna	40	O	M	Sweeper	Double	2 yrs	19·10·09	26·10·09				nil	nil	yes	3 days	Eyes quiet - wound healed	GOOD	
43	3151	19·10·09	Buta	50	H	M.		Double	2 yrs	19·10·09						nil	yes				
44	3152	19·10·09	Mana	56	M	M	Culti	Double	2 yrs	19·10·09	29·10·09				nil	nil	yes	3 days	Eye slightly red	GOOD	

42	3150	19.10.09	Rukna	40	O	M	Surapa	Double	2 yrs	19.10.09	26.10.09			nil	nil	yes	3 days	Eyes quiet - wound healed	GOOD		
43	3151	19.10.09	Buta	50	H	M.		Double	2 yrs	19.10.09					nil	yes					
44	3152	19.10.09	Mana	56	M	M	Cultt	Double	2 yrs	19.10.09	29.10.09			nil	nil	yes	3 days	Eyes slightly red	GOOD		
45	3153	19.10.09	Likar	50	M.	M.	Jalahi	Left	2 yrs	19.10.09	26.10.09			nil	nil	yes	3 days	Eyes quiet	GOOD		
46	3154	19.10.09	Gopi	39	H	M		Double		19.10.09				Vit. R+L	B.P. 130	yes					a drop Vit. R+L
47	3155	19.10.09	Piru	50	M	M		Double		19.10.09					nil	yes					
48	3156	19.10.09	Nathu	40	M.	M.	Cultt	Double	2 yrs	19.10.09	26.10.09			R capsule left	Nil	yes	3 days	Eyes quiet	GOOD		
49	3157	19.10.09	Chatar Singh	60	H	M.	" "	Double	2 yrs	19.10.09	27.10.09			nil	nil	yes	3 days	Eyes irritable	GOOD		
50	3158	19.10.09	Abdalla	60	M	M	Mosh	Right	2 yrs	19.10.09	27.10.09	Dm.		nil	nil	yes	3 days	Eyes quiet - no tremble	GOOD		
51	3159	19.10.09	Mammi	50	M	M.		Double		19.10.09					nil	yes					
52	3161	19.10.09	Nanak	60	M	M.	Changa	Left	2 yrs	19.10.09	26.10.09			nil	nil	yes	3 days	Eyes quiet - no tremble	GOOD		
53	3162	19.10.09	Budhu	60	M	M.	Jalahi	Double	2 yrs	19.10.09	26.10.09			nil	nil	yes	3 days	Eyes slightly red	GOOD		
—	Summary + notes: 33 Cataract operations in the capsule today. - a small amount of Vit. was lost in each eye. of case No 3154 - the lenses were very difficult - many more 40 - cataracts "Jeans like" in appearance. - 2 capsules burst - 4 or 5 turned over the rest came out right																				Oct. 19.09 33 cases
54	3163	19.10.09	Mamira	60	H	M		Right		19.10.09					nil	yes					
55	3184	20.10.09	Ruri	30	M	M	Cultt	Double	2 yrs	20.10.09	27.10.09			nil	nil	yes	3 days	Eyes good	GOOD		
56	3185	20.10.09	Sahibi	48	M	F.		Double		20.10.09				nil	nil	yes					
57	3186	20.10.09	Mano	70	H	F.	Cultt	Double	2 yrs	20.10.09	28.10.09			nil	nil	yes		Good eyes. wounds healed	GOOD		
58	3187	20.10.09	Amir Shah	60	M	M	" "	Double	2 yrs	20.10.09	31.10.09			nil	nil	yes	3 days	Eyes quiet - no tremble	GOOD		
59	3188	20.10.09	Juidan	60	H	F.	" "	Double	2 yrs	20.10.09	26.10.09			nil	nil	yes	3 days	R. corneal hazy. L. good.	GOOD		
60	3189	20.10.09	Nazam Din	45	M	M	Fakir	Left	2 yrs	20.10.09	28.10.09			nil	nil	yes	3 days	Eyes quiet - no tremble	GOOD		
61	3190	20.10.09	Dep Ditta	45	O	M.		Double		20.10.09					nil	yes					
62	3191	20.10.09	Ckkajoo	50	M	M.		Left		20.10.09		Dm			nil	yes.					
63	3192	20.10.09	Nesan	45	M	F.		Double		20.10.09					nil	yes.					
64	3193	20.10.09	Pira	50	M	M.	Cultt	Double	2 yrs	20.10.09	28.10.09	Dm		nil	nil	yes	3 days	R. quiet L. slight haziness	GOOD		
65	3194	20.10.09	Takarth	40	H	M	Shop K.	Double	2 yrs	20.10.09	29.10.09			nil	nil	yes		no daily notes	GOOD		
66	3195	20.10.09	Tabi	40	M	F.		Left		20.10.09					nil	yes					
67	3196	20.10.09	Jano	45	M	F	Cultt	Left	2 yrs	20.10.09	27.10.09			nil	nil	yes	3 days	Eyes good	GOOD		
68	3197	20.10.09	Kuhni	45	H	F.	Cultt	Double	2 yrs	20.10.09	27.10.09			R.E. Vit	a deep R	yes	3 days	Eyes good -	GOOD		
69	3198	20.10.09	Jhandoo	60	O	M		Left		20.10.09					nil	yes					
70	3199	20.10.09	Thakari	45	H.	F.	Brihm	Double	2 yrs	20.10.09	26.10.09			nil	nil	yes	3 days	Eyes good - doing well	GOOD		
—	Summary + notes: 28 Cataract operations in capsule today - one slight loss of Vit. in the capsule was recovered - the lens turned in 3 cases broken -														nil cases required	Spoon	delivery	- One capsule burst -			Oct. 20. '09 28 cases
71	3229	22.10.09	Rura	50	O	M	Sahiba	Left	2 yrs	22.10.09	28.10.09			nil	nil	yes		no remarks	GOOD		
72	3230	22.10.09	Mela	45	H	M	Bhista	Double	2 yrs	22.10.09	27.10.09			Nil	nil	yes			GOOD		
73	3231	22.10.09	Aki	50	M	F	Fakir	Double	2 yrs	22.10.09	28.10.09	L. Dm.		Nil	nil	yes		28.10.09 Wounds Healed	GOOD		
74	3232	22.10.09	Gopi	35	H	M.	Cultt	Double	2 yrs	22.10.09	27.10.09	Dm.		nil	nil	yes.		no remarks	GOOD		
75	3233	22.10.09	Atah Bak	30	M	M	Jalahi	Left	2 yrs	22.10.09	27.10.09			nil	nil	yes		" "	GOOD		
76	3234	22.10.09	Sahadi	69	M	M	Bhisti	Double	2 yrs	22.10.09	29.10.09			nil	nil	yes		" "	GOOD		
77	3236	22.10.09	Shah Din	50	M.	M.	Lulan	Double	2 yrs	22.10.09	28.10.09			nil	nil	yes		" "	GOOD		
78	3239	22.10.09	Sahha Singh	68	H.	M.	Cultt	Double	2 yrs	22.10.09	27.10.09			nil	nil	yes		" "	GOOD		
79	3240	22.10.09	Hakam " "	39	H	M.		Double		22.10.09											
80	3241	22.10.09	Warjan " "	45	H	M.	Cultt	Right	2 yrs	22.10.09	28.10.09			nil	nil	yes		no remarks	GOOD		
81	3242	22.10.09	Ladho	40	H	F	" "	Double	2 yrs	22.10.09	29.10.09			nil	nil	yes		Wounds healed Good 29/10	GOOD		
82	3243	22.10.09	Bila Singh	54	H.	M.	" "	Double	2 yrs	22.10.09	28.10.09			R cap burst in nil	nil	yes		no remarks.	R. FAIR. L. GOOD.		
83	3245	22.10.09	Mustfa Kha	50	M	M	Sumer	Right	2 yrs	22.10.09	28.10.09			nil	nil	yes		" "	GOOD		
—	Summary + Notes: 22 Cataract operations in capsule today. - two villagers last. one capsule wounded by knife and left behind - One Spoon delivery 2 cases capsule burst. but were acquired "one of the two turned over"																				Oct. 22. 1909 22 Cases.

TABLE · OF · CATARACT · OPERATIONS —— Continued –

D.T. Vail –

NO.	Regist.	ENTRANCE DATE	NAME	AGE	Caste	Sex	Occupation	Cataract	Duration	DATE Operation	DATE Discharge	IRIS	LENS	CORNEA	OPERATION Complication	VITREOUS ESCAPE	Iridectomy	EYE DRESSED	DAILY · Particulars & Treatment	VISION RESULT	REMARKS
84	3279	23.10.09	Rafi	60	M	F	Gugni	Double	3 yrs	23.10.09	3.11.09				nil	nil	yes	3 days	Redness - both Eyes.	POOR	Both Eyes Poor Vis
85	3281	23.10.09	Gehli	50	M	F		Double		23.10.09											
86	3282	23.10.09	Sidi	60	M	F	Gugni	Double	2 yrs	23.10.09	29.10.09				nil	nil	yes		no remarks	GOOD	
87	3283	23.10.09	Omri	56	M	F	Carpenti	Double	2 yrs	23.10.09	29.10.09				nil	nil	yes		good recues –	GOOD	
88	3286	23.10.09	Jasa	50	M	M	Culti	Right	2 yrs	23.10.09	28.10.09				nil	nil	yes		no remarks	GOOD	
89	3287	23.10.09	Mohadi	43	M	M	" "	Left	2 yrs	23.10.09	29.10.09				Cap. BURST	nil	yes		"Very troublesome man"	GOOD	
90	3288	23.10.09	Ganga	30	M	M	Julaha	Double	2 yrs	23.10.09	29.10.09				nil	nil	yes		no remarks	GOOD	
91	3289	23.10.09	Jiwan	40	O	M	Chor	Double	2½ yrs	23.10.09	29.10.09				nil	nil	yes		" "	GOOD	
92	3290	23.10.09	Jahanda	50	M	M	Carpenti	Double	2 yrs	23.10.09	30.10.09			Both	Caps Burst	nil	yes		" "	GOOD	Difficult Delivery
93	3292	23.10.09	Rato	50	H	F		Double		23.10.09			L. Im.				yes.				
94	3294	23.10.09	Bala	60	M	M		Right									yes.				
95	3293	23.10.09	Maman	50	M	F	Culti	Double	2 yrs	23.10.09	29.10.09		L. Im.		nil	nil	yes.		no remarks	GOOD	
96	3296	23.10.09	Jami	60	M	M	Teli	Double	2 yrs	23.10.09	28.10.09				nil	nil	yes		" "	GOOD	
97	3297	23.10.09	Budh Singh	56	H	M	Culti	Right	2 yrs	23.10.09	28.10.09				nil	nil	yes		" "	GOOD	
98	3299	23.10.09	Maman	60	M	M	Culti	Double	2 yrs	23.10.09	31.10.09		Black		nil	nil	yes.		" "	GOOD	
99	33°1	23.10.09	Mohadi	56	M	M		Left		23.10.09							yes.				
—	Summary and Notes: — 27 Extractions in the capsule today Oct 23. 1910. No untoward escapes. One Squeezed out Iris at the moment the section was completed. Two capsules ruptured. Four Black cataracts consecutively. One Spoon delivery Today –																				Oct. 23. 27 cases.
100	3330	24.10.09	Bazi	50	M	F	Culti	Double	2 yrs	24.10.09	31.10.09			Some Vit. L.		None R.	yes	3 days	Good Vision - Wounds healed	GOOD	
101	3331	24.10.09	Purami	50	O	F	Sweeper	Right	2 yrs	24.10.09	30.10.09				nil	nil	yes	3 days	" " Cornea clear	GOOD	
102	3332	24.10.09	Juiani	45	M	F	Barber	Double	2 yrs	24.10.09	31.10.09				nil	nil	yes	3 days	" " wounds healed	GOOD	
103	3336	24.10.09	Harbajh	50	O	M	Chomi	Double	2 yrs	24.10.09	31.10.09				nil	nil	yes		no remarks	GOOD	
104	3337	24.10.09	Jagiri	50	H	M	Kahar	Double	2 yrs	24.10.09	31.10.09				nil	nil	yes		no remarks	GOOD	
105	3338	24.10.09	Sukha	43	H	M	Dholi	Double	2 yrs	24.10.09	31.10.09				nil	nil	yes		L. Previously Couched	GOOD	
106	3339	24.10.09	Fateh Singh	56	H	M		Right		24.10.09							yes.				
107	3343	24.10.09	Chanda Singh	60	H	M	Culti	Double	2 yrs	24.10.09	31.10.09			Opacity	nil	a drop L.	yes		no remarks	GOOD R. L Cornea Mac.	
108	3344	24.10.09	Bhagi	45	M	F	" "	Right	2 yrs	24.10.09	31.10.09				nil	nil	yes		" "	GOOD	
109	3345	24.10.09	Ramon	48	H	F	Shop.	Double	2 yrs	24.10.09	29.10.09				nil	nil	yes	3 day	Cured	GOOD	
—	Summary and Notes: — 17 Extractions in capsule today: — one untoward escape "a drop" no capsules one burst – one was a couched lens that had crept down. One by a "rawal" it came out Easily –																				Oct 24. 17 cases.
110	3364	26.10.09	Kaki	32	M	F	Culti	Left	2 yrs	26.10.09	6.11.09				Cap Burst	nil	yes		no remarks	GOOD	
111	3366	26.10.09	Jiwa	56	M	M	Ghoma	Double	2 yrs	26.10.09	6.11.09				nil	nil	yes	3da.	Eyes quiet - No trouble	GOOD	
112	3368	26.10.09	Batna	30	H	M	Culti	Right	2 yrs	26.10.09	1-11.09				Cap Burst	nil	yes	3da	" " " "	GOOD	
113	3370	26.10.09	Nathu	56	M	M	Fakir	Double	2 yrs	26.10.09	3.11.09				nil	nil	yes	3da	" " Both Good	GOOD	
114	3371	26.10.09	Ala Ditta	56	M	M	Bhan	Double	2 yrs	26.10.09	3-11.09				nil	a drop R	yes	3da	Irritable. 5/11/09 Wound Gaping	Right L. Good.	
115	3373	26.10.09	Rakan Dui	45	M	M	Fakir	Double	2 yrs	26.10.09					nil	nil	yes	3da	Eyes red - Vis. good. Healed	GOOD	
116	3375	26.10.09	Butha	56	M	M	Sek	Double	2 yrs	26.10.09	2.11.09				nil	nil	yes	3da	" quiet - Eyes good - No trouble	GOOD	
117	3376	26.10.09	Mia Singh	53	H	M	Culti	Double	2 yrs	26.10.09	2.11.09				nil	nil	yes	3da	" " cornea clear.	GOOD	
118	3380	26.10.09	Natha "	56	H	M	"	Double	2 yrs	26.10.09	6.11.09				nil	nil	yes	6da	" " " "	GOOD	
119	3381	26.10.09	Phula "	60	H.	M.	"	Double	2 yrs	26.10.09	6.11.09		Immat. Leucoma		Nil	nil	yes	6 da	Wound Gaping 4/11/09 Wound healed	GOOD	R. Macula L. old
120	3382	26.10.09	Bishan "	60	H	M	"	Double	2 yrs	26.10.09	6.11.09		Immat		nil	nil	yes	6da	Both eyes good –	GOOD	
121	3383	26.10.09	Imam Din	60	M	M	Ghoma	Double	2 yrs	26.10.09	6.11.09		" "		nil	nil	yes	6da	" " quiet. No trouble	GOOD	
122	3384	26.10.09	Nikali	45	H	F	Culti	Right	2 yrs	26.10.09	31.10.09				nil	nil	yes		wound healed	GOOD	
123	3385	26.10.09	Bibi	40	M	F	Fakir	Double	2 yrs	26.10.09	3.11.09		Im.		nil	nil	yes	4da	Eyes doing well	GOOD	
124	3386	26.10.09	Fatan	54	M	F	Carpenti	Left	2 yrs	26.10.09	3.11.09		"		nil	nil	yes		no remarks	GOOD	
125	3387	26.10.09	Mukabar	48	M	F	Culti	Left	2 yrs	26.10.09	6.11.09				nil	nil	Button Hole	3da	Eye good - doing well	GOOD	
126	3388	26.10.09	Jan	47	M	F	Culti	Double	2 yrs	26.10.09					nil	nil				GOOD	

124	3386	26.10.09	Fatan	54	M	F	Carpenta	Left	2 yrs	26.10.09	3.11.09		"		nil	nil	yes		no remarks	GOOD	
125	3387	26.10.09	Mukabar	48	M	F	Culti	Left	2 yrs	26.10.09	6.11.09				nil	nil	Button Holed	3da	Eye good - dark tree	GOOD	
126	3389	26.10.09	Jeo	50	M	F	Culti	Double	2 yrs	26.10.09	6.11.09				nil	nil	yes		no remarks	GOOD	
127	3390	26.10.09	Nathu	50	O	M	Sweeper	Right	2 yrs	26.10.09	3.11.09				nil	nil	yes	6da	Wound healed - No good	GOOD	
128	3391	26.10.09	Bhulan	45	H	F	Culti	Left	2 yrs	26.10.09	3.11.09				nil	nil	yes		no remarks	GOOD	
129	3393	26.10.09	Raja	45	M	M	Mal	Double	2 yrs	26.10.09	5.11.09				R cap. Left	nil	yes		V. good. Both wounds healed	GOOD	
130	3394	26.10.09	Mitu	60	H	M	Brik.	Double	2 yrs	26.10.09	2.11.09				nil	nil	yes	3da.	Eyes quiet - no trouble	GOOD	
131	3395	26.10.09	Rahdi	45	H	F	Brik	Double	2 yrs	26.10.09	4.11.09				nil	nil	yes		Wounds healed Vis good	GOOD	
132	3396	26.10.09	Ganesh	60	H	M		Left		26.10.09							yes				
133	3397	26.10.09	Bislan Dai	45	H	F	Culti	Left	2 yrs	26.10.09	2.11.09				nil	nil	Button Holed	3da	Eyes good	GOOD	
134	3398	26.10.09	Thakari	40	H	F	Carpenta	Right	2 yrs	26.10.09	2.11.09				nil	nil	yes		no remarks	GOOD	
—	Summary and Notes: 40 cataracts in the capsule today. 2 capsules ruptured but nine secured - One Nitrous "a drop" lost. This was the first day in the New Victoria Memorial Hospital at Jullundur - There were 59 cataracts in all —																				Oct. 26. 1909 40 cases
135	3455	27.10.09	Amir Begam	40	M	F	Wajit. Sh	Right	2 yrs	27.10.09	2.11.09				nil	nil	yes	3da.	Eye good	GOOD	
136	3456	27.10.09	Gulab dai	50	H	F		Double		27.10.09							yes				
137	3457	27.10.09	Gabi	60	H	F	Carpi-	Double	2 yrs	27.10.09	2.11.09				nil	nil	yes		Wounds healed Cornea Clear	GOOD	
138	3458	27.10.09	Piru	40	M	M	Teli	Double	2 yrs	27.10.09	2.11.09				nil	nil	Button Holed	5da	Both eyes good - wounds healed	GOOD	
139	3459	27.10.09	Parenu	43	H	F.	Barber	Double	2 yrs	27.10.09	2.11.09				nil	nil	yes		Wounds healed. cornea Clear	GOOD	
140	3460	27.10.09	Sahibi	48	H	F	Culti	Double	2 yrs	27.10.09	6.11.09		Im.L		nil	nil	yes	3da	Cough - Rt. good - Lt slight haze	GOOD	
141	3461	27.10.09	Kesa	45	H.	F.		Left		27.10.09							yes				
142	3462	27.10.09	Makabar	35	M	F	Bhistya	Double	2 yrs	27.10.09	2.11.09				nil	nil	yes		Wounds healed - Cornea Clear	GOOD	
143	3464	27.10.09	Maman	30	M	F	Sulaha	Double	2 yrs	27.10.09	2.11.09				nil	nil	yes		" " " "	GOOD	
144	3465	27.10.09	Mohamid Shah	50	M	M	Syid	Double	2 yrs	27.10.09	2.11.09			Some Lens	Cap. Lower Rt. Meridian	nil	yes	3da	Eyes quiet - No trouble	GOOD	
145	3470	27.10.09	Jewni	40	H	F		Double		27.10.09							yes				
146	3472	27.10.09	Ato	53	M	F	Culli	Double	2 yrs	27.10.09	3.11.09				nil	nil	Button Holed Rt.		No daily record Kept	GOOD	
147	3473	27.10.09	Bhudi	34	M	F	" "	Double	2 yrs	27.10.09	3.11.09			L. Con. Hazy	nil	nil	Button Holed R		Cornea Clear - Wounds healed	GOOD	
148	3475	27.10.09	Rustab Shah	50	M	M	Syid	Left	2 yrs	27.10.09	7.11.09				nil	nil	yes		No daily record Kept	GOOD	
149	3477	27.10.09	Naman	30	M	M	Culti	Right	2 yrs	27.10.09	6.11.09				nil	nil	yes	4da.	Both eyes red	GOOD	
150	3479	27.10.09	Brijlau	19	H	M		Double		27.10.09							yes				
—	Summary and notes: Oct 27. 1909 — I did 28 extractions in the capsule today with no loss of Vitreous - Two capsules ruptured but were secured - In one case a small amount of lens matter was left behind - The patients behaved badly as a class - Most of mine were females																				Oct. 27. 1909 28 cases.
151	35 11	28.10.09	Thando	50	M	F	Tulali	Double	2 yrs	28.10.09	4.11.09				nil	nil	yes	3da	Eyes good - Wounds healed	GOOD	
152	3512	28.10.09	Dijan	60	H	F	Culti	Double	2 yrs	28.10.09	4.11.09				nil	nil	yes	3da	" "	GOOD	
153	3513	28.10.09	Umre	50	M	F	Culti	Double	2 yrs	28.10.09	5.11.09				nil	nil	yes	3da	Eyes red - L. cornea hazy.	GOOD	
154	3514	28.10.09	Jiwi	56	M	F	Culti	Double	2 yrs	28.10.09	4.11.09				nil	nil	yes	3da	" "	GOOD	
155	3516	28.10.09	Genda	60	H	M	Shop Kpr	Double	2 yrs	28.10.09	9.11.09				nil	nil	yes	3da	Eyes quiet - No trouble	GOOD	
156	3517	28.10.09	Raji	56	M	F	Culti	Right	2 yrs	28.10.09	5.11.09				nil	nil	yes	3da.	Eyes red - Vis good	GOOD	
157	3518	28.10.09	Lalo	40	M	F		Double		28.10.09							yes				
158	3519	28.10.09	Ako	56	M	F	Culti	Left	2 yrs	28.10.09	2.11.09				nil	nil	yes	3da	Eye good	GOOD	
159	3520	28.10.09	Mitu	35	M	M	" "	Double	2 yrs	28.10.09	6.11.09				nil	nil	yes	3da	Eyes quiet - No trouble	GOOD	
160	3521	28.10.09	Piran Ditta	50	M	M	Shakh	Double	2 yrs	28.10.09	6.11.09			Leucom	nil	nil	yes	3da	" "	GOOD	

TABLE. OF. CATARACT. OPERATIONS. ——— Concluded ——— D.T.Vail.

NO.	Register	ENTRANCE DATE	NAME	AGE	Caste	Sex	Occupation	Cataract		DATE Operation	DATE Discharge	IRIS	LENS	Cornea	OPERATION Complication	VITREOUS ESCAPE	Iridectomy	EYE Dressed	DAILY Particulars and Treatment	VISION RESULT	REMARKS.
161	3524	28.10.09	Bhani	30	H	F	Culti	Double	2½	28.10.09	4.11.09				nil	nil	yes	3 da	Cornea clear - Eyes good	GOOD	
162	3525	28.10.09	Umra	63	M	M	Culti	Right	2½	28.10.09	6.11.09				nil	nil	yes	3da	Eyes quiet - Vis. Good	GOOD	
163	3526	28.10.09	Atoo Singh	50	H	M		Double		28.10.09											
164	3527	28.10.09	Hira	50	H	M	Culti	Double	2½	28.10.09	4.11.09				nil	nil	yes	3da	Wounds healed - Eye good	GOOD	
165	3528	28.10.09	Umar Ban	50	M	M	Culti	Right	3½	28.10.09	6.11.09				nil	nil	yes	3da	No trouble	GOOD	
166	3529	28.10.09	Dyal Singh	50	H	M	Culti	Left	2½	28.10.09	6.11.09				nil	nil	yes	3 da	" "	GOOD	
167	3530	28.10.09	Nand Gir	40	H	M	Sahib	Right	2½	28.10.09	9.11.09				nil	nil	yes	3 da	" "	GOOD	
168	3531	28.10.09	Bela Singh	56	H	M	Culti	Double	2½	28.10.09	3.11.09		Im.		nil	nil	yes	3da	Eyes good.	GOOD	
169	3532	28.10.09	Dara	30	M	M	Culti	Left	2½	28.10.09	4.11.09				nil	nil	yes	3da	Eyes quiet. Wound healing	GOOD	
170	3533	28.10.09	Atham Singh	56	H	M	Culti	Left	2½	28.10.09	3.11.09				nil	nil	yes	3 da.	Eye good - Cornea clear	GOOD	
171	3534	28.10.09	Surgeon "	36	H	M	Culti	Right	2½	28.10.09	6.11.09				nil	nil	yes		Wound healed -	GOOD	
172	3535	28.10.09	Aso	56	M	F	Culti	Double	2½	28.10.09	6.11.09		R.Im.		nil	nil	yes	3 da	R. cornea hazy. L. Good	R Hazy. L Good.	
173	3536	28.10.09	Gabi	50	H	M	Culti	Double	2½	28.10.09	5.11.09		Im		nil	nil	yes		R.E. good. L.E. nil	R. Good L. Nil.	
174	3537	28.10.09	Hurmat	56	M	F	Sud	Double	2½	28.10.09	4.11.09				nil	nil	yes	3 da	Wounds healed -	GOOD	
175	3538	28.10.09	Alah Ban	40	M	M	Mulan	Double	4½	28.10.09	6.11.09				nil	nil	yes	3da		GOOD	
176	3539	28.10.09	Narim Singh	65	H	M		Right		28.10.09											
—	Summary and Notes: I did 4/2 extractions in cap'sule today: No vitreous escape: 3 cases requiring spoon delivery: all kinds of cataract represented: 3 capsules burst at moment of delivery																			Oct 28.1909 4/2 cases.	
177	3569	29.10.09	Doola	56	M	M	Culti	Double	2½	29.10.09	6.11.09				nil	nil	yes	3 da.	Eyes irritable	GOOD	
178	3570	29.10.09	Surgeon Singh	63	H	M	Culti	Double	2½	29.10.09	6.11.09				nil	nil	yes	4 da	Wounds healed	GOOD	Lt. Ross. R.E.
179	3571	29.10.09	Nathu	50	O	M	Ramdi	Double	2½	29.10.09	7.11.09				nil	nil	yes	3 da	Wounds healed - Eyes red	GOOD	Lieut Ross. R.E.
180	3572	29.10.09	Hira	50	H	M	Culti	Right	2½	29.10.09	6.11.09				nil	nil	yes	3 da	Eye quiet	GOOD	
181	3575	29.10.09	Hira	56	H	M		Double		29.10.09	7.11.09				nil	nil	yes	3 da.	Cornea Clear - Wounds healed	GOOD	
182	3576	29.10.09	Sadhu	33	H	M	Teli	Double	2½	29.10.09	7.11.09				nil	nil	yes	3da	" " " "	GOOD	
183	3577	29.10.09	Maru	50	H	M	Culti	Double	2½	29.10.09	6.11.09		L.Im.		nil	nil	yes	3 da		GOOD	
184	3578	29.10.09	Naram Singh	56	O	M	Jala R	Double	2½	29.10.09	6.11.09				nil	nil	yes	3da	Vision good -	GOOD	
185	3579	29.10.09	Ghania " "	56	O	M	Jah. Ra	Right	3½	29.10.09	6.11.09				nil	nil	yes	3da	Eyes quiet - Not trouble	GOOD	
186	3580	29.10.09	Lal Singh	50	H	M		Double		29.10.09											
187	3581	29.10.09	Jawala	50	O	M		Right		29.10.09											
188	3584	29.10.09	Gabi	36	O	F	Chom	Double	2½	29.10.09	6.11.09		Leucoma Cor		nil	nil	yes			GOOD	
189	3586	29.10.09	Marini	56	H	F	Bhisti	Left	2½	29.10.09	5.11.09				nil	nil	yes		Good vision	GOOD	
190	3588	29.10.09	Atri	45	H	F	Culti	Right	2½	29.10.09	2.11.09		Leucoma Cor.		nil	nil	yes	4 da	Wound healed. Poor vision	DIM	Left Hosp. 4 da.
191	3590	29.10.09	Ashaii	60	M	F	Carpet	Double	2½	29.10.09	4.11.09				nil	nil	yes		Wounds healed - Good Vis	GOOD	
—	Summary and Notes: I did 2 3 extractions today: 2 cases of cracked lens left by "Rawal" No "spoon" cases today. One capsule burst: In several cases the cataracts were stubborn but came without complications																			Oct 29.09 2 3 Cases.	

191	3590	29.10.09	Ashaki	60	M	F	Carpti	Double	2 yrs	29.10.09	4.11.09				nil	nil	yes		Wounds healed - Good Vis	GOOD	
—	Summary and Notes: I did 23 Extractions today: 2 cases of couched lens left by "Rawal" "No "spoon" cases today } Oct 29.09																				
	one capsule rupt: In several cases the cataracts were stubborn but came away with complications																				23 cases
192	3614	30.10.09	Lachmas Das	56	H	M		Left		30.10.09											
193	3617	30.10.09	Sahibo	50	M	F	Bajt	Double	3 yrs	30.10.09	6.11.09				nil	nil	yes	3 da	Eyes good -	GOOD	
194	3618	30.10.09	Jiwi	45	M	F	Syed	Right	2 yrs	30.10.09	5.11.09				nil	nil	yes	3 da	Good Vis. Wound healed	GOOD	
195	3619	30.10.09	Ater Khan	30	M	F	Jalahi	Double	3 yrs	30.10.09	7.11.09				nil	nil	yes	3 da	Eyes good	GOOD	
196	3622	30.10.09	Karam	60	M	M	Fakir	Right	3 yrs	30.10.09	8.11.09				nil	nil	yes	5 da	no trouble -	GOOD	
197	3623	30.10.09	Nathu	56	M	M	Barbir	Double	2 yrs	30.10.09	8.11.09				nil	nil	yes	3 da	Both cor. clear -	GOOD	
198	3624	30.10.09	Manon	45	H	F	Culti	Right	3 yrs	30.10.09	5.11.09				nil	nil	yes	3 da	Wound healed	GOOD	
199	3625	30.10.09	Meya	40	H	M	Brihi	Right	3 yrs	30.10.09	10.11.09				nil	nil	yes	3 da	Eyes fair able -	GOOD	
200	3626	30.10.09	Mahgi	50	H	M	Bhishti	Double	2 yrs	30.10.09	7.11.09				nil	nil	yes	3 da		GOOD	
201	3628	30.10.09	Kirpo	40	H	F	Brihi	Double	3 yrs	30.10.09	8.11.09				a drop	Vitreous R	yes	3 da	Both Eyes good -	GOOD	
202	3629	30.10.09	Narim	38	H	M	Culti	Right	3 yrs	30.10.09	8.11.09				nil	nil	yes	3 da	Eyes quiet - Cor. Clear	GOOD	
203	3630	30.10.09	Wazira	63	M	M	Culti	Double	2 yrs	30.10.09	6.11.09				nil	nil	yes			GOOD	
204	3633	30.10.09	Rama Nand	70	H	M	Carpti	Double	2 yrs	30.10.09	7.11.09				nil	nil	yes	3 da	Both Eyes quiet	GOOD	
205	3634	30.10.09	Nihal Singh	70	H	M	Brihi	Double	2 yrs	30.10.09	8.11.09				nil	nil	yes	3 da	Wounds healed - Cor Clear	GOOD	
206	3635	30.10.09	Matat " "	60	H	M	Sclero	Left	2 yrs	30.10.09	7.11.09				nil	nil	yes	3 da	Eye quiet	GOOD	
—	Summary and Notes: I did 23 extractions today: There were 3 capsules rupt: all 3 caps were } Oct. 30.1909																				
	received by Smith: One case lost "a drop" of nitreous: Spoon but induced twice today: } 23 cases.																				
207	3664	31.10.09	Rakii	48	M	M	Barbi	Right	2 yrs	31.10.09	8.11.09				nil	nil	yes	4 da	Eye quiet Cor. Clear	GOOD	
208	3665	31.10.09	Khem Singh	70	H	M	Culti	Right	2 yrs	31.10.09	8.11.09				nil	nil	yes	4 da	" " no trouble	GOOD	
209	3666	31.10.09	Nathe Shah	40	M	M	Syed	Right	2 yrs	31.10.09	7.11.09				nil	nil	yes	4 da	" " cor. Clear	GOOD	
210	3667	31.10.09	Chawa	50	M	M	Culti	Double	2 yrs	31.10.09	7.11.09				nil	nil	yes	6 da	Wounds healed Cor Clear	GOOD	
211	3668	31.10.09	Gandu	50	H	M	Culti	Left	3 yrs	31.10.09	7.11.09				nil	nil	yes	3 da	Wound healed	GOOD	
212	3670	31.10.09	Buta	45	O	M	Sweep	Right	2 yrs	31.10.09	8.11.09				nil	nil	yes	4 da	Eyes quiet	GOOD	
213	3672	31.10.09	Bhota	43	O	M	" "	Double	2 yrs	31.10.09	8.11.09				nil	nil	yes	4 da	Wounds healed Cor Clear	GOOD	
214	3673	31.10.09	Ghulam Md	56	M	M	Fakir	Left	3 yrs	31.10.09	8.11.09				nil	nil	yes	3 da	Eye quiet - healed	GOOD	
215	3674	31.10.09	Khazam Sh	50	H	M	Culti	Left	3 yrs	31.10.09	8.11.09				nil	nil	yes			GOOD	
216	3675	31.10.09	Bhari	43	M	F	Carpti	Right	3 yrs	31.10.09	9.11.09				nil	nil	yes	3 da	Wound healed -	GOOD	
217	3676	31.10.09	Jewi	60	H	F	Culti	Left	3 yrs	31.10.09	19.11.09				nil	nil	yes	3 da	Wounds " Vis Good	GOOD	
218	3677	31.10.09	Rami	54	H	F		Double		31.10.09											
219	3678	31.10.09	Gujri	60	H	F	Brihi	Double	3 yrs	31.10.09	10.11.09				nil	nil	yes	3 da	Eyes good	GOOD	
—	Summary and Notes: I did 17 Extractions today, no vitreous loss: one capsule rupt: —— { Oct. 31.1909 17 cases																				

A MIXED TUMOR OF THE LACHRYMAL GLAND.[1]

By GEORGE H. KNAPP, M.D., Cincinnati.

(With two illustrations on Text-Plate I.)

TUMORS of the lachrymal gland are of interest because of their rarity and clinical importance, but above all they are of interest from a purely pathologic viewpoint, both histogenetically and as regards their classification and structural relationship to certain neoplasms found in the parotid and submaxillary glands.

The following case is from the private practice of Dr. Robert Sattler, to whom I am indebted for permission to report it and for the following clinical note.

J. G. R., age 46, had for years known of the presence of a painless nodular mass on the left upper lid at the outer canthus, but only during the last few years did it force itself on his attention by its increasing size and prominence. During the last few years the growth became more annoying owing to pressure on the globe and drooping of the lid. When seen in June this droop was pronounced and the tumor quite prominent. Removal of the growth was followed by prompt healing.

PATHOLOGIC REPORT.

The tumor is almost spherical, of firm consistence, and its greatest diameter measures 20*mm*. The specimen was bisected, fixed in formalin and in Zenker's fluid, imbedded in celloidin, and stained by the usual methods.

MICROSCOPIC EXAMINATION

The tumor is surrounded by a capsule composed of several

[1] From the Pathologic Laboratory of the Ophthalmic Hospital.

superimposed layers of dense fibrous tissue containing in its meshes a few elongated nuclei. A few fibrous trabeculæ extend into the tumor from the capsule and gradually disappear in its substance.

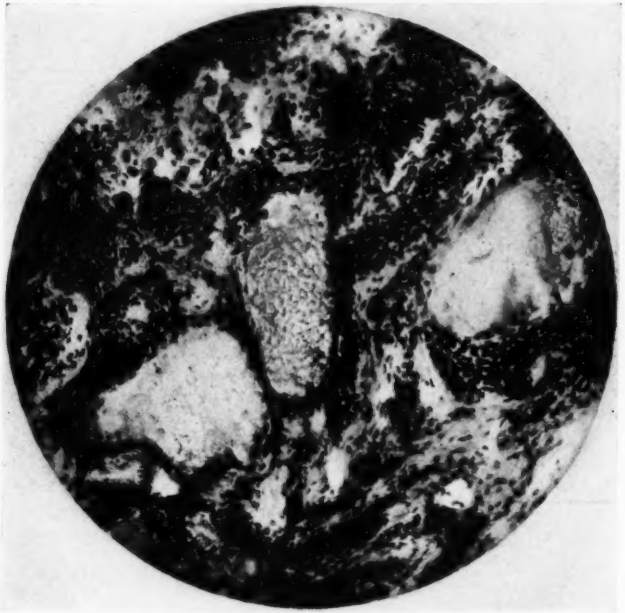
The tumor proper consists of a stroma of loose fibrous tissue and of a parenchyma made up of cells approximating the endothelial type, having a large, homogeneous, evenly staining nucleus, and arranged in the form of long strands, or closely packed in groups having a rounded outline, or they have an arrangement resembling the acini of the normal lachrymal gland.

The stroma has in certain areas undergone myxomatous degeneration; it contains isolated cells in variable numbers; some of these are round, others spindle-shaped.

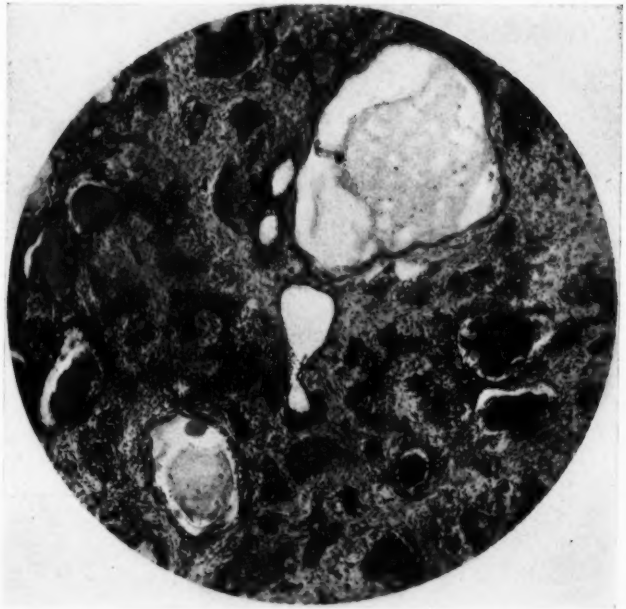
The tendency to formation of gland spaces by the cells of the parenchyma is especially marked toward the more central portions of the tumor, but these groups of cells forming gland spaces resembling the acini of the normal lachrymal gland are found throughout the growth. The open space in the centre of these atypic acini varies in size and is occupied by a basophilic staining substance which is probably mucin. In the smaller gland spaces the cells of the innermost layer are more or less round and have an oval nucleus; in the larger acini the cells of the innermost layer are flattened and have an elongated nucleus as if they had undergone compression from within. In places long strands of nucleated cells pass off from the gland spaces or in immediate proximity to them. The round groups of closely packed cells appear to have been abortive attempts at gland formation. There is a remarkable disposition in certain parts for the cells to arrange themselves in whorls somewhat after the manner of the cellular arrangement in the typical endothelioma of the dura mater. There are but few blood-vessels and for the most part they occupy the peripheral portions of the tumor.

Tumors of the lachrymal gland are usually first noticed in early life. They are of slow growth, painless, produce pressure symptoms only, and are of low malignancy, with little tendency to recur after removal. Exceptionally they are said to have malignant tendencies. Herbert Parsons (1), also Collins and Mayou (2), state that the simultaneous occurrence

To Illustrate Dr. George H. Knapp's Article on "A Mixed Tumor of the Lachrymal Gland."



Mixed Tumor of Lachrymal Gland. x 140.



Mixed Tumor of Lachrymal Gland. x 60.

of tumors of the lachrymal and salivary glands has been observed (Fuchs, Snell, Miculicz), but a perusal of the histories of these cases leads one to believe that they belong to a different category than the kind of tumor under discussion. Structurally the tumors in these cases were probably lymphomata or lympho-sarcomata, and should be classed under the head of simultaneous or symmetric glandular enlargements having an etiologic relation to the illy defined group of leukæmias or pseudo-leukæmias.

Until quite recent times the classification of lachrymal tumors was most diverse: by some they were regarded as sarcomata or carcinomata; in other instances hyphenated names were applied to them to express the presence of their elementary constituents. More recently there has been a tendency in certain directions to regard these tumors as endotheliomata, analogous to those of the parotid and submaxillary gland and arising histogenetically from the endothelium of the lymph spaces. This view was advanced especially by Warthin (3). Verhoeff (4) questions their endothelial origin because of the presence of certain features characteristic of epithelial structures in the parenchymatous elements of these neoplasms.

Structurally there is a close similarity between the lachrymal and salivary glands. The mixed tumors of the parotid gland are analogous to the lachrymal tumors under consideration. The views of Wood (5), who made an exhaustive study of mixed parotid tumors, are therefore apropos in this connection. In substance his conclusions are:

(*a*) That there is a group of extremely complicated tumors occurring in the facial region which contain elements from both epi- and meso-blast in intimate relation.

(*b*) The presence of elements of mesoblastic origin in the stroma of these tumors may be explained by the assumption of an embryonic misplacement of the mesoblast.

(*c*) Sufficient data are not at hand for considering the cells of the parenchyma as of endothelial origin, and while the cells are of epithelial origin in a certain percentage of cases their characteristics are not of sufficient constancy to ascribe to them an undoubted epithelial origin in all cases.

While the exact origin of these tumors remains *sub judice*,

it seems best not to apply to them any term which carries with it an implied origin, such as endothelioma or myxochondroma endotheliale, as suggested by Warthin; or to designate them as tumors of mixed mesoblastic tissue, as suggested by Collins and Mayou, but to term them simply mixed tumors of the lachrymal gland without further modification.

REFERENCES.

1. J. HERBERT PARSONS. *The Pathology of the Eye.*
2. COLLINS and MAYOU. *The Pathology and Bacteriology of the Eye.*
3. WARTHIN. *Archives of Ophthalmology*, 1901.
4. VERHOEFF. *Journal of Medical Research*, 1905.
5. WOOD. *Annals of Surgery*, 1904.

INDIVIDUAL DIFFERENCES OF THE NORMAL CILIARY BODY

A CONTRIBUTION TO THE STUDY OF GLAUCOMA.

By Professor C. HESS, Würzburg.

Translated from the German Edition of these Archives for October, 1910, by Dr. Matthias Lanckton Foster.

(With eight illustrations on Appended Plates VI. and VII.)

WHILE dealing with the accommodative changes in the human eye with the aid of the methods developed by me, I was led to study certain peculiarities of the normal ciliary system, and I take this opportunity to report some of these observations, which may be of interest in the study of the origin of primary glaucoma.

Parts of the ciliary system of different *normal* eyes are shown on the accompanying plates as they appear in the strong, down-falling light of a Zeiss arc light, magnified twenty times. The majority of these eyes were enucleated a few hours after death; I immediately had them divided equatorially and the actual conditions of the surfaces of the anterior halves recorded by means of drawings; the eye meantime in a suitable hollow in a block of paraffin in order to avoid deformation. After the eyes had been fixed for one or two days in formol I placed the anterior halves in a freezing mixture; after sagittal section the contour of the cut surfaces of the ciliary system were again recorded with the drawing instruments. The drawings were completed with the use of Zeiss's binocular loupe.

Figs. 1 and 2 show the surfaces and sections of an infant, Figs. 3 and 4 the corresponding pictures of a man 80 years old with healthy eyes. In the infant the ciliary processes are

narrow, thin bands fairly far apart, with flat, irregular folds visible between them. The surface of the processes is uniformly pigmented and a considerable space separates their apices from the margin of the lens.

In the eye of the 80 years old man the individual processes are thicker and plumper, often thickened like clubs toward the lens; the intermediate spaces between the individual processes are much smaller (compare Figs. 3 and 8); at the bottom of these spaces numerous lumpy, or sausage-shaped knobs are visible. The summits of the processes, which in the infant form straight, dark, comparatively narrow stripes, here appear white, irregular, much broader, and studded with bulbous outgrowths. The distance from the lens is considerably less than in the infant, the broad, clubbed processes reach in many cases to the equator, in other eyes they extend more or less far toward the anterior surface of the lens.

In Fig. 4 the lens has been removed in order to give a better view of several processes. It can be seen how great bulbous, white masses, which extend close to the posterior surface of the iris, have been established over the entire extent of the pigmented portion of the ciliary body, backward, inward, and forward. In such eyes the thickened anterior ends of the ciliary processes often press into the posterior surface of the iris so that the impressions in the iris can be perceived even in the hardened, cut eye (indications of this may be seen in Fig. 8). The ciliary process of an 80 years old man shown in Fig. 4 is, in the neighborhood of its apex, about three times as thick as in the infantile eye.

The iris itself, especially near its root, is not infrequently twice as thick in the eyes of old people as in those of infants (see Fig. 7). The vessels in the senile iris often are distinctly visible as gray tubes, while in young eyes little or nothing can usually be perceived.

As regards the importance of these changes in the origin of glaucoma, the great individual differences in the development of the bulbous outgrowths on the summits of the ciliary processes are of interest. Altogether I find them more greatly developed in old age than in youth, yet there is by no means a *uniform* increase with age. Referring to the widespread idea that an enlargement of the ciliary processes is due to a

hypertrophy of the ciliary muscle, I wish to say that I have found the changes here depicted *independently* of the size of the ciliary muscle.

The following observations may give an idea of the individual differences which come here into consideration. I found the ciliary processes of persons 60 years old and younger similar to those in the depicted eye of a man of 80; on the other hand, in the normal eye of a man 67 years old they were covered almost uniformly by dark brown pigment and the whitish deposits were nearly completely absent. The processes were correspondingly thin and narrow, so that they resembled more nearly the picture of those in the infant than those of the 80 years old, although the individual summits were larger and not quite so regular as in the young eye. Even at 40 years and younger I found the bulbous outgrowths strongly developed and resembling the picture of the 80 years old woman more than that of the just mentioned man of 67; in a man of 34 I found white deposits more strongly developed on the summits than in another man of 59.

Fig. 6 shows the processes in the eye of a man, 59 years old, with moderate axial myopia, which had to be enucleated on account of a sarcoma that originated near the papilla and had grown to the middle of the vitreous; the eye was pale, with no trace of inflammation, on the whole strikingly poor in pigment, the same as the other eye. The processes showed only narrow but fairly high white deposits, at some distance from the margin of the lens, while in other eyes of the same age I not rarely found them in almost immediate contact with it. Along the upper surface of one process a little vessel was visible (as is not rare in eyes which present no trace of inflammation).

I also found the zonula fibres in old people often distinctly thicker than in young ones. In the examination of fresh eyes they may usually be seen in old age as more or less fine, radiating fibres, while with the same illumination and magnification they can scarcely be seen, if at all, in the eye of an infant.

The following measurements of mine may be of some interest, although because of their individual differences they cannot be claimed to be generally valuable.

In an infant I found the diameter of the fresh lens to be

from 7.2 to 7.4*mm*, in a man 80 years old from 9.4 to 9.6*mm*. The diameter of the ciliary ring in the eye of an infant was from 8 to 8.2*mm*, in that of an 80 years old person from 9.4 to 9.6*mm*. (Sometimes the measurement was between two opposite summits of the ciliary processes.)

While the diameter of the lens in a person 80 years old is about 2.2*mm* greater than in an infant, the diameter of the ciliary ring is only about 1.4*mm* greater. In another infant I found the diameter of the lens to be 5 to 5.5*mm*, that of the ciliary ring to be 7*mm*.

As great individual differences are met with in old age: in the eye of a person 37 years old the diameter of the fresh lens was from 9 to 9.5*mm*, that of the ciliary ring scarcely any larger; in the fresh eye of a person 82 years old the diameter of the lens was 10*mm*, that of the ciliary ring only about 9*mm*.

That a disproportion between the size of the lens and the size of the ciliary ring may be due not only to individual differences of the *lens*, but also to those of the ciliary ring, is shown by measurements of eyes fixed in formol of a person 40 years old and of another 80 years old; in the former the diameter of the lens was 10*mm*, of the ciliary ring 11*mm*, in the latter the ciliary ring was 9*mm*, 1*mm* less than the diameter of the lens, which was no larger than that of the former; in a person 34 years old I found the diameter of the lens to be 9.5*mm*, that of the ciliary ring a little smaller, in a person 63 years old the diameter of the lens was 9.75*mm*, that of the ciliary ring about .75*mm* larger. In two persons, one 40 and the other 42 years old the lenses were approximately of the same size (9.75–10*mm*), while the ciliary ring of the former measured 9.5*mm*, and that of the latter 10.5 to 10.75*mm*.

The greatest diameter of the ciliary ring I met with was in the above mentioned myope of 59; it was somewhat over 11*mm*, while that of the lens was about 10.

The descriptions of the ciliary body in the text-books on anatomy bear little or no relation to the pictured conditions. Thus, for example, Merkel and Kallius mention only that "the free margins of the ciliary processes are sometimes more, sometimes less sinuous. We find the curl-like convolutions most marked and most uniformly in eyes which are fixed while still warm with life, which would seem to show that the

contraction of the ciliary muscle increases the folding." Our observations show that the contraction of the muscle is of no importance for the grape-like outgrowths in question. I have examined several pairs of eyes in which the ciliary muscle of one was fixed in a state of spasm induced by eserin, the other in a state of rest induced by atropin; no difference appeared between them as to the conditions in question; their peculiarities were due to great individual differences and those dependent on age.

It is further stated in the same place that the ciliary processes surround the lens "yet without reaching its margin. By their whitish color they stand out sharply against the uniform brown surroundings. This color depends on the fact that the cells of the retinal epithelium covering the ciliary processes have lost their pigment."

Our preparations show, on the contrary, that the processes reach the margin of the lens, and even beyond to its anterior surface, frequently in old age and not rarely in middle life, even in perfectly *normal* eyes. The white color of their summits is frequent, though by no means regular, in middle and old age, but not in infants; it is really caused *not* by loss of pigment, but by the deposit of newly formed whitish masses over the pigmented layer (see Fig. 4). Such deposits are met with not rarely on the plicæ ciliares, in the interspaces between the ciliary processes, where they appear as white, bulbous formations (see Fig. 8).

Clinically the points here made were touched upon in the following papers:

In a description of the senile changes of the uvea R. Kerschbaumer (*A. f. O.*, Bd. 34, 4, 1888) makes this statement: "The processus ciliares are longer and more branched in old age, as may be seen by macroscopic examination. Particularly are the anterior parts of the ciliary processes increased. They run forward toward the axis of the eye for a distance parallel to and near the iris. By the greater development of the ciliary processes forward the root of the iris is shoved against the cornea, which results in a contraction of the anterior chamber together with a deepening of the sinus."

The illustrations, made from microscopic sections, which accompany Kerschbaumer's article, permit the easy recog-

nition of the origin of the grape-like outgrowths from proliferated cells of the pars ciliaris. Hack confirmed this condition by the microscopical examination of several senile eyes. The *topographical* conditions of special interest to us just now are shown less clearly in the microscopic sections of hardened eyes than in the way here described.

Some remarks of Fuchs appended to a description of the glaucomatous eye of a patient 66 years old are of interest (*Arch. f. Ophth.*, Bd. 30, 3, p., 125, 1884): "The ciliary muscle, but especially the ciliary processes, have increased considerably in volume. An ample branching of the ciliary processes goes hand in hand with a corresponding enlargement of their surfaces. . . . The question is whether these changes are to be considered as inflammatory swelling, or as simple hypertrophy. According to Weber, who first called attention to the enlargement of the ciliary processes in glaucoma, it is due to hyperæmia with consecutive œdema and extravasation of blood."

In regard to his case Fuchs came to the following conclusion: "This appears to be only a simple hyperplasia of the ciliary body, perhaps unusually large, but still physiological. It seems not improbable to me that the ciliary body was of the same, or only slightly less, dimensions before the attack of glaucoma, and perhaps these dimensions were a source of danger to the eye. . . . Perhaps the examination of numerous eyes of aged people would demonstrate the frequent presence of such voluminous ciliary bodies and that these eyes have a certain predisposition to glaucoma."

In his text-book (1907) Fuchs designates as an actuating cause of glaucoma, together with the dilatation of the pupil, a stasis in the veins of the ciliary processes; "these swell therefore and reach directly to the margin of the lens, as the circumlental space is so narrow." In the senile hypermetropic eye the ciliary processes are unusually large "because the ciliary muscle is hypertrophied through the constant accommodation."

Levinsohn (1908) considers the primary attack of glaucoma to be the consequence of an occlusion of the passage for drainage in the angle of the anterior chamber by infiltration of pigment; this forms in glaucoma an extremely frequent,

perhaps the regular, condition, the pigment always coming from the ciliary portion of the iris, or of the anterior part of the ciliary processes. At this place it is injured by "hypertrophy of Mueller's muscle and the ciliary processes," "which results in an alteration of the epithelial coat of Mueller's muscle and an infiltration of the ligamentum pectinatum by the broken-down pigment epithelium, in addition to a contraction of the anterior chamber by the displacement of the root of the iris." In a glaucomatous eye he found a "great enlargement of the ciliary muscle," which he thought to be caused "primarily by an increase and thickening of the connective tissue within Mueller's muscle, perhaps also somewhat by a hypertrophy of the circular fibres"; the latter harmonizes with the hypertrophy of smooth muscle tissue noticeable in general senility (myomatosis, hypertrophy of the prostate), and also with the fact that glaucoma occurs chiefly in hypermetropes "in whom Mueller's muscle is especially developed or hypertrophic."

A. Weber, in his work on glaucoma (*Arch. f. Ophthalm.*, 23, 1, 1877), first designated the ciliary processes in glaucomatous eyes as "moderately swollen," and speaks of "tensely distended and erected loops of vessels" and "œdematous tissue." Priestley Smith (1888, 1891) gave as the exciting cause of glaucoma conditions "which distend the uveal tract with blood and enlarge the ciliary processes," such as lowering of the circulation and congestion of the nervous system. The ciliary processes varied in their form in correspondence with the amount of blood contained in their vessels and were "swollen" in glaucomatous eyes. On the other hand, such a swelling may be not the cause, but the result, of the glaucoma. "We have seen that great pressure upon the choroid leads to swelling of the ciliary processes and to serous effusion from this organ." In another place he says: "If the glaucoma was of recent date and congestive they are enlarged so that their apices extend forward far beyond their usual limits . . . but if the glaucoma has lasted a long time the processes are sometimes greatly shrunken and retracted far back from the root of the iris. But even in such cases the iris often shows the imprint of a former contact." This description by Priestley Smith is accompanied by two illustrations of sections through a healthy

and a primarily glaucomatous eye. According to my findings, similar and even considerably greater differences than are shown there may be found in perfectly normal eyes, even when the comparison is made between eyes of approximately the *same* age. In normal eyes of *different* ages still greater differences are not uncommon.

The teaching which regards a swelling of the ciliary processes in consequence of disturbances of circulation as a cause of glaucoma certainly has much that is attractive and seems able to help us over many difficulties; but we must not forget, I think, that in a considerable number of cases of primary glaucoma *all* indications of such a swelling are absent. The same is true of the hypothesis advanced by Czermak, that the shallowing of the anterior chamber preceding the attack is due to a diminished secretion of aqueous.

We are not in position to-day to decide whether and in how far a hyperæmia of the ciliary body met with in an eye enucleated for glaucoma is the cause or the result of the glaucomatous increase of tension. Judgment whether the ciliary processes in a glaucomatous eye are "normal" or "abnormally large," whether they are swollen, or only the described bulbous outgrowths not due to swelling are present, can be rendered with some certainty only after we know sufficiently the limit of the physiological fluctuations in the growth of the ciliary processes. In view of the incompleteness of the statements in our anatomical text-books, the accompanying illustrations of different normal ciliary bodies may be of some interest. They show how bulbous outgrowths develop on the summits of the ciliary processes in the course of life, partly between the ages of 30 and 40, perhaps still earlier, which increase in size, some more rapidly, some more slowly, and consequently cause in different normal eyes a very different increase of volume, especially of the ciliary summits. They are more common in old age than in youth, but may be almost totally absent at the age of 67. *The size* of these formations *is in fact independent of the size of the ciliary muscle.*

The difference of the development of the pictured outgrowths in conjunction with (within certain limits independently of) a difference in the diameter of the ciliary ring causes that even in *normal* eyes in middle and old age the

ciliary summits may be sometimes more or less distant from the equator of the lens, sometimes pressed closely upon it so that they seem to touch, or to encroach more or less on the anterior surface of the lens. According to my measurements, individual differences of the ciliary body are at least of as great importance as such differences in the diameter of the lens, if not of greater.

Where the bulbous outgrowths are more strongly developed they demonstrably press forward the iris in a greater or smaller number of places; if the lenses are very large in comparison with the eye (Pr. Smith), this must be the case very easily and to a considerably large extent. If together with the physiological thickening of the iris the periphery of the anterior chamber is continually made more shallow, a change in the width of the pupil, which formerly had no influence on the intraocular pressure, may now, ***even with normal circulation***, lead readily to a more or less complete occlusion of the angle of the anterior chamber.

It is not quite a matter of indifference to our conception of glaucoma and of its treatment whether we are to consider the attack as primarily due to circulatory disturbances which cause a more or less sudden swelling of the ciliary processes, or to slowly developing changes in the topography of the iris and of the angle of the chamber in the normal eye.

I do not deal here with the details of the glaucoma problem, but rather call attention to certain, perhaps insufficiently considered, peculiarities of the normal ciliary body. Some of the questions indicated here may be answered by the systematic examination of suitable eyes in the manner described. I hope to speak of certain therapeutic consequences at another time.

Explanation of the Plates.

All the illustrations are drawn from *normal* eyes magnified twenty times.

Figs. 1 and 2. Eye of an infant.

Figs. 3 and 4. Corresponding parts of an eye from a man 80 years old.

Fig. 5. Ciliary processes from a man 82 years old.

Fig. 6. Ciliary processes from a man 59 years old.

Fig. 7. From the eye of a man 40 years old. (The depth of the anterior chamber in Figs. 2, 4, and 7 does not correspond accurately to the conditions in life as slight displacements were unavoidable in cutting the eyes.)

Fig. 8. From the eye of a man 77 years old (the lens is removed).

REPORT OF THE THIRTY-SEVENTH MEETING OF THE GERMAN OPHTHALMOLOGICAL SOCIETY AT HEIDELBERG, AUGUST 3–5, 1911.

Abridged Translation from Vol. LXX., No. 1, German Edition of these ARCHIVES, by Dr. PERCY FRIDENBERG, New York.

FIRST SCIENTIFIC SESSION; CHAIRMAN, GULLSTRAND (UPSALA)

1. HAAB (Zuerich): **The magnet operation.** Haab finds it illogical to localize the foreign body with X-rays and sideroscope and then to extract by way of the anterior chamber with the Haab magnet, as this instrument, owing to its diverging lines of force, will attract the steel splinter, no matter where it may be. To extract through the pupil, we must prevent the foreign body becoming entangled in the posterior surface of the iris. This is best assured by having the patient sit up so that he may be able to dodge back with the head. The surgeon must be able to make and break the contact with his foot. Foreign bodies situated far back may have to be drawn toward the side and the equator and then forward. The magnet can never be too strong. If a weak pull is wanted the point may be held farther from the eye or a longer point may be used. The extraction by way of the anterior chamber is always to be preferred to that through a scleral incision, on account of the danger of detachment later. The measurement and weighing of 250 steel splinters by Haab shows that the size and shape of most foreign bodies are particularly well suited to magnet extraction by his method.

Discussion: PFALZ (Duesseldorf) noted the difficulty of preventing loss of aqueous in Haab's method, and lays stress on the importance of localization with the sideroscope. He questions whether it is the injuring of the vitreous or that of

the retina which is to be more feared as a cause of later retinal detachment.

STOELTING (Hannover) presented statistics in favor of diascleral extraction. HAAB in closing the discussion advised loosening the foreign body by trial pull with the magnet at the equator, and extraction forwards without previous localization with the sideroscope. He again warned of the dangers of incision through the sclera.

2. ELSCHNIG (Prag): **Substitution of vitreous.** The author had had an exceedingly favorable result in a case of repeated hemorrhages into the vitreous with vision reduced to light perception from injection of 0,80% salt solution after drawing off 0,6*ccm* of the turbid, flocculent vitreous. Two weeks later this procedure was repeated. Experiments on rabbits then showed that from 0,4–0,8*ccm* vitreous can be drawn off and replaced by salt solution without ill effects, whereas severe complications, opacities, and detachment follow the simple aspiration of vitreous. Hyper- and hyp-isotonic solutions are less suitable as substitute fluids. The procedure has been tested on 15 eyes with severe affection of the vitreous, 6 with vitreous changes plus retinal detachment, and 1 of recent injury with loss of vitreous. In only 2 cases was there any reaction, iritis, and in 1 rise of tension, where more than 0,6*ccm* had been injected. The best results objectively and functionally were obtained in 4 cases of vitreous hemorrhage. The procedure may be repeated if necessary, but not more than 0,6*ccm* is to be injected at any one time. The canula is introduced in the outer-lower quadrant near the ora serrata, after dissecting up the conjunctiva and passing provisional sutures.

Discussion: GUTMANN (Berlin) reported a case of loss of large amount of vitreous during cataract extraction. In spite of replacing the lost fluid with salt solution, detachment came on later. WESSELY (Wuerzburg) insisted on the futility of attempting to replace vitreous by salt solutions, as shown by experimental studies. AXENFELD (Freiberg) presented statistics showing the successful injection of physiological salt solution to replace vitreous. ELSCHNIG, in closing, laid stress on the fact that his remarks referred in the main to loss and replacement of vitreous produced methodically and

purposively and not to accidental loss of vitreous in the course of cataract extractions and other operations.

3. KRUECKMANN (Koenigsberg): **Therapeutic effect of heat in rheumatic affections of the anterior segment of the globe.** In this study of rheumatic iritis stress is laid on the successive development and arrangement of deposits on the cornea and lens capsule, the relapsing fibrinous exudations on top of the posterior synechiæ, the occurrence of hemorrhage when iritic adhesions tear loose, the development of retro-corneal pannus, and the immunity of the posterior chamber. Gouty or uratic iritis, the relation to muscular and articular rheumatism, the effects of a diathermic treatment, and of radium emanations, were also referred to.

Discussion: FLEMMING (Berlin) found radium, in substance, of value to relieve pain but without any effect on the organic lesions. PFALZ (Duesseldorf) notes the frequency of scleroiritis with marked tendency to involve the cornea, in rheumatic cases. ELSCHNIG (Prag) finds that tongue-shaped proliferation on the posterior surface of the cornea is not confined to rheumatic affections. SCHIECK (Goettingen) notes that antibodies have not as yet been found in rheumatic affections, so that the serobiology of the aqueous is not a promising field. v. MICHEL (Berlin) notes the importance of vascular changes often seen in microscopic sections, as an indication of the arteriosclerotic basis of these forms of iritis. WESSELY (Wuerzburg) reports experiments as to the therapeutic value of radium in gout. Sodium urate introduced into the anterior chamber of rabbits causes little reaction while very irritating subconjunctivally. Radium emanations appeared to have no effect on the rate of absorption of this substance. IGERSHEIMER (Halle) refers to the loose way of diagnosing "rheumatic" affections, the importance of excluding tuberculosis and syphilis, and the need of general and local serobiological tests. In answer to this, KRUSIUS (Berlin) refers to observations in Neisser's clinic of positive local reaction to salvarsan in undoubtedly tuberculous (lupus) processes. KRUECKMANN in closing said that he judged of the beneficial effects of radium treatment in uratic iritis by the diminution of sodium urate in the blood, and drew attention to the difference between clinical gout attacks and the condition artificially

produced by the introduction of sodium urate into the anterior chamber.

4. GILBERT (Munich): **Pathogenesis of congenital total cataract,** reports the microscopic study of the left eye of a child of six months with bilateral congenital cataract and slight degree of left microphthalmos, showing complete disintegration of the lens, extensive rupture of the posterior capsule with thin remnants of the tunica vasculosa lentis covering over this defect in the posterior surface of the lens. Persistent hyaloid artery was present as well as the retinal anomalies noted by Seefelder at the ora serrata. It appears that persistence or insufficient retrogressive metamorphosis of the tunica vasculosa and hyaloid vessels is the etiological factor in total cataract as well as in lenticonus posterior and posterior polar cataract. We cannot well accept as a sufficient cause some indefinite intra-uterine inflammation or draw an analogy with zonular cataract. The retinal anomalies, too, were ascribed to traction by the embryonal mesoderm.

5. VON SZILY, Jr. (Freiburg): **Developmental basis of congenital ocular defects.** Mechanical interference by persistent connective tissue strands in the closing of the primitive optic vesicle is the generally accepted factor in the causation of all colobomata. The author shows that ectodermal factors, more particularly germinal variation, play an important rôle, at least for deep-seated colobomata.

6. PAGENSTECHER (Strassburg): **Experimental production of congenital cataract and ocular deformities in vertebrates.** Naphthalin poisoning of pregnant rabbits caused central and lamellar, anterior and posterior polar, cataract and fusiform lenticular opacities in three litters which were raised. The toxic etiology was proven by the development of cataracts and the administration of naphthalin to the mothers at a time when the lens vesicle had already been separated. Early intoxication was combined with the mechanical factor of lens separation as shown by the development of lenticular defects, or that of the fœtal cleft, leading to coloboma of iris and choroid, lenticonus, and persistent hyaloid artery. Even marked defects of the lids and cornea could be produced, showing that all congenital defects can certainly not be ascribed to variation of the germ and heredity.

Discussion: KRUSIUS (Berlin) asks whether these defects acquired toxically can develop into hereditary peculiarities by breeding, and notes the importance of this question for theories of heredity.

PAGENSTECHER: Reproduction took place in only one of the deformed animals and there was no evidence of inheritance of the acquired defects in that case.

7. V. ROHR (Jena): **New ideals in construction of optical apparatus**, notes two improvements in Gullstrand's 1911 ophthalmoscope, consisting in a prismatic plate which fuses the reflections from the anterior and posterior surface, and aplanatic lenses which give an image free from aberration. The telescopic spectacles originally intended for high degrees of myopia are now made for lower ametropia with a lens made of two halves cemented together, doing away with annoying color fringes and allowing correction of astigmatism for the entire field.

8. HEGNER (Jena): **Adaptation of spectacles to space.** The effect of glasses on binocular vision depends largely on the associated movements of the eyes. The calculation of the angles is complicated. Hegner has simplified the matter by a photographic method which shows the points of correspondence in the focal plane of the glasses formed when the intersections of the principal rays are placed in the position occupied by the centre of rotation of the globe.

Discussion: STOCK (Jena) notes the importance of these points in centring glasses and the part incorrectly adjusted lenses play in the gradual development of eye-strain and asthenopia.

9. IGERSHEIMER (Halle): **Action of salvarsan on the eye.** Experimental and clinical study. Repeated injections of Ehrlich's remedy in rabbits and a dog failed to produce any toxic symptoms, ophthalmoscopic changes, or microscopic lesions. In cats, however, marked degeneration of the ganglion cells of the retina with slight changes in the nerve followed subacute intoxication, or the chronic form following long-continued administration of ¼ grain. General loss of hair was marked in these cases, indicating, as does the Marchi-reaction also noted, a toxic action due to slowly evolved inorganic arsenic. The neuro-recidives are not due to salvar-

san, but to syphilis. Luetic forms of chorio-retinitis and papillo-retinitis do well on salvarsan, as shown by relief of marked hemeralopia, return of normal color perception, restoration of the field, and disappearance of ring-scotoma. Iritis and parenchymatous keratitis do not respond at all promptly, and ocular palsies are not improved. In congenital syphilis, salvarsan is strongly indicated as it causes a negative Wasserman reaction in over half the cases. This is very unusual with ordinary mercurial treatment.

10. BECKER (Dresden): **Treatment of eye-diseases with salvarsan**, reports 3 cases of heredito-specific interstitial keratitis, 8 of acquired syphilitic iritis, 4 of cerebral syphilis with ocular complications, 1 of deep sclerosing corneal infiltrate in an aged patient due to acquired lues. In the last case there was marked improvement, but the other corneal affections did not benefit greatly. Iritis due to acquired syphilis was rapidly cured, and cerebral syphilis and neurorecidive in the early stages of lues were markedly improved. Permanent cure requires the combination of salvarsan with mixed treatment. Arsenobenzol has no ill effect on the optic nerve. The intravenous method is preferred. In the *discussion*, stress was laid on good effects of salvarsan where rapid action is required. It certainly does not produce a general sterilization, as originally claimed, as relapses are noted in spite of negative Wasserman. In specific retinitis, capillary hemorrhages have been noted after salvarsan, but it is not fair to attribute them to this remedy, as they have been seen in the course of mixed treatment, or may have been due to intercurrent nephritis. One case of tabes with unusually rapid progress of blindness after salvarsan was reported. Sudden ophthalmoplegia and ulceration on the sole coming on a few hours after injection also speak for a direct toxic action of this drug. Mild degrees of optic neuritis are common in lues before and without salvarsan treatment, as routine examinations of the fundus are now the rule.

FIRST DEMONSTRATION SESSION, AUGUST 3D; CHAIRMAN, BIELSCHOWSKY (LEIPZIG).

1. WESSELY (Wuerzburg): **Experimental pathology of lenticular defects.** W. reports a case of coloboma lentis with

defect in the zonule fibres exactly corresponding, supporting the author's view that this alone is sufficient to cause typical developmental anomalies of the lens. He was able to produce isolated opacities of lens fibres by the contact diffusion action of copper or brass. Fine silver-plated entomological needles were used for this purpose. When thrust into the cortex of the lens peculiar opacities were the result, which ran along within one or two fibres but crossed the sutural lines and went from one surface to the other, producing peculiar ribbon-like grayish tracks. The microscopic picture was not characteristic.

2. KRUSIUS (Berlin): **Experimental ocular tuberculosis.** The period of incubation is inversely proportionate to the amount of infection. The degree of receptivity for tuberculosis is highest in the vitreous, and descends through anterior chamber, cornea, conjunctiva, to the lens. During an incubation period of 3–4 weeks, tubercle bacilli introduced into the anterior chamber were very rarely carried into the general circulation. This speaks for a very slow rate of diffusion and filtration from the anterior chamber and allows the inference that immediately after inoculation the bacilli are bound down by inflammatory fibrinous adhesion. Old tuberculin introduced into the anterior chamber causes transitory irritation and then bleaches the iris, especially in tuberculous subjects. This is not a specific action, but due to simple inflammatory irritation. Old tuberculin introduced into the vitreous causes a mild irido-cyclitis which runs its course in a few weeks, without leaving permanent synechiæ, but with marked lowering of tension and some depigmentation.

3. REIS (Bonn): Microscopic specimens. (*a*) **Congenital defect of Descemet's membrane.** This condition, combined with anterior synechia, is a typical developmental arrest. In advanced stages it may produce the secondary buphthalmos in very young children. (*b*) **Persistent membrana capsularis lentis.** This appeared as a dense membrane on the posterior surface of the lens and was associated with persistent hyaloid artery. Clinically it closely resembled a glioma of the retina.

4. SEEFELDER (Leipzig): Developmental and embryological specimens. (*a*) Serial sections of the **nerve of young embryos** 8–12*mm* long, showed that the central groove of the optic

nerve extends throughout the entire eye-stalk. (*b*) **Complete anophthalmos in a pig embryo** 9*mm* long. 2. 5½-day-old **chick with anophthalmos,** showing a tube of pigment epithelium containing numerous nerve fibres and connected by a solid strand with the brain. On the other side there was a coloboma, from the edge of which nerve fibres ran to the retina. A large area of the outer retinal leaf remained at the level of primitive epithelium and had not been differentiated into pigment layer. This is the probable genesis of many so-called choroidal colobomata.

5. V. SZILY, Jr. (Freib.): **Cell pathology of corneal and conjunctival epithelium.** Extrusion of chromatin from the nucleus is important in the interpretation of inclusions. In trachoma there appears to be granular degeneration of nuclei and the detritus may be mistaken for a pathogenic factor, or "trachoma body."

6. NAGANO (Wuerzburg): **Experimental pathology of corneal endothelium,** showed specimens of endothelial changes in corneal disease due to the action of silver nitrate, bee stings, lightning, lime burn, bichloride, naphthalin, ultraviolet light, ammonia vapor, etc.

7. GILBERT (Munich): **Stain for medullary nerve sheaths,** advises Held's glia stain of hæmatoxylin, after using iron-alum as a mordant, and differentiating in ferrocyanide-borax. The sheaths appear dark blue or bluish black.

8. IGERSHEIMER (Halle): **Experimental syphilis,** showed specimens of iritis produced by injecting spirochæte-cultures in a rabbit. Small foci due to exudation were found in the retina, and a single spirochæte in the sclera. The condition produced was a genuine syphilitic inflammation.

9. KRUECKMANN (Koenigsberg): **Healing of scleral wounds,** presented drawings showing the transplantation of flaps without pedicle into scleral incisions from another sclera, the fascia lata, and from the saphenous vein.

10. SCHREIBER (Heidelberg): **Teratoid osteoma of the conjunctiva.** The tumor was removed from the eye of a girl of 12, having grown rapidly in a short time. The location, between the insertions of the superior and external rectus, and the presence of bone, nerve, and muscle tissue showed the teratoid character of the growth. There was little fatty

tissue, and none of the cutaneous elements found in lipodermoids at this site.

11. FREYTAG (Munich): **Perimetric charts.** To register conditions of examination more exactly the printed form is arranged to indicate the character and amount of illumination, whether natural or artificial, and the general and subjective condition of the patient, as influenced by fever, headache, exhaustion, nervousness, hunger, faulty fixation, etc. The charts for the centre of the field are in the scale of four to one and attached to the back of the full chart.

12. GULLSTRAND (Upsala): **Demonstration of the Nernst slit-lamp.** The specific brightness of the luminous slit facilitates focal illumination with aspherical ophthalmoscopic lenses in the study of the structure of the vitreous, and by doing away with corneal reflexes makes ophthalmoscopic examination in the upright image as well as retinoscopy very easy.

13. ROEMER (Greifswald): **Sub-muscular trephining of sclera in glaucoma.** The v. Hippel trephine was applied after tenotomy of the inferior rectus. 2–4*mm* of sclera may be removed in animal eyes without ill effects. The healing takes place by new formation of thin scleral tissue without any inclusion of the muscle. A slight but lasting diminution of tension is caused. Fifteen cases of primary glaucoma were operated on. In these the reduction of tension was not lasting.

Discussion: HOLTH (Christiania) has tried and abandoned this operation, as did Argyll-Robertson (1874), who also operated only on blind glaucomatous eyes. His later operation, and that of Lagrange and of Elliot, are very effective. Filtration scars, or rather scleral fistulæ, result almost always. Tension is permanently reduced, and the glaucomatous excavation may disappear, as noted also by Axenfeld. v. Hippel reserves scleral trephining as a substitute for enucleation in absolute glaucoma.

14. RUBEN (Heidelberg): **Transplantation of rat sarcoma in rats' eyes.** Preliminary communication noting limited growth of tumors in vitreous, anterior chamber, and lens. The tumor cells have a histolytic action on the lens capsule and destroy other tissue in the interior of the globe by marked proliferation.

15. BIELSCHOWSKY (Leipzig): Demonstrations. (1) **Hering's confusion test for color blindness.** A camera obscura with a milk-glass plate, one half of which is illuminated by red and one half by green rays. Blue light may be thrown on the red half, allowing all gradations through purple. A slit allows the luminosity of the green area to be varied widely. (2) **Stereoscope for muscle exercises.** An adjustable mirror allows horizontal and vertical displacement of one image. The luminosity is reduced, to correspond with visual differences, by inserting smoked glass slips of various shades.

16. WOLFRUM (Leipzig): Specimens. (1) **Incipient vernal catarrh.** (2) **Incipient carcinoma of bulbar conjunctiva.** (1) Early changes at the limbus, consisting in proliferation of plasma cells about vessels, with eosinophile cells under and in the epithelium, which shows an increase of layers and proliferation into the deeper strata. Destruction of the protoplasma connections of the epithelial cells was noted at points where no sub-epithelial changes could be detected, indicating that vernal catarrh involves the epithelium primarily.

(2) A thickening of the epithelial layer which may be detected clinically with a loupe and appears as a glassy, transparent swelling, is the earliest change. Spontaneous proliferation of detached epithelium into the depths preceded differentiation of cells into characteristic tumor elements which may be pigmented or unpigmented.

17. ATTIAS (Munich): **Senile histological changes.** Various interesting specimens.

18. KRAUSS (Marburg): **Rare affection of the optic papilla.** Primary tumor appearing in the form of a light red smooth protuberance covering the disk in a healthy man of 26. Blood-vessels could be seen in the depths of the translucent growth, and there was evidence of choking about the disk. Operation was advised but the patient went away.

Discussion: SCHIECK (Goettingen) saw the same patient later. The tumor had increased in size without any inflammatory manifestations and had led to detachment involving the macula. Tuberculin and Wasserman tests were negative. Enucleation would be advisable. BARTELS (Strassburg) reported a similar case in which the non-irritating tumor turned out to be a tuberculous granuloma.

SECOND SCIENTIFIC SESSION, AUGUST 4, 1911; CHAIRMAN, KUHNT (BONN).

11. WESSELY (Wuerzburg): **Experimental compensatory hypertrophy of ciliary processes.** W. referred to the rôle of the pecten and choroid in the formation of vitreous fluid in lower animals. Injections of gall and of cholates into the vitreous of rabbits produced cataract, with complete connective-tissue degeneration of the retina and choroid, while the iris and ciliary processes were not affected. The posterior segment of the globe becomes phthisical while the anterior segment remains apparently normal. The vitreous space may disappear entirely while the anterior chamber is greatly enlarged and assumes a vicarious function. The ciliary processes are markedly hypertrophied, appearing as dense convolutions. This compensatory growth indicates the rôle of the choroid in the production of vitreous fluid in mammals.

Discussion: STRAUB (Amsterdam) notes that his injections of aspergillus into the vitreous also produced posterior phthisis bulbi and indicated that the pars plana was the source of vitreous fluid. HAMBURGER (Berlin) referred to his view of the iris as a source of intraocular fluids.

12. FLEMMING and KRUSIUS (Berlin): **Action of radiant energy on experimental ocular tuberculosis.** Tests of radium and mesothorium on isolated bacteria, and on the eye before and just after inoculation, as well as after development of clinical symptoms, indicated a decided positive action. This was especially striking in amelioration of the disease after it had developed. The bactericidal action is definite but not marked, and much less active than that of strong sunlight.

Discussion: KRAUSS (Marburg) refers to the effect of sunlight in high altitudes and the complicating factor of barometric variations. MAYWEG (Hagen) reports excellent clinical results with radium, which showed a decided selective action on diseased tissue.

13. HEILBRUN (Erfurt): **Practical value of bacteriological examination of conjunctival secretion before cataract operation.** Smears from 137 conjunctival sacs showed xerosis, 63.5%, staphylococcus albus, 76%, staphylococcus aureus, 2.2%, micrococcus catarrhalis, 0.8%, pneumococcus, 24.1%, diplobacillus (Morax-Axenfeld), 6.6%, pneumo-bacillus, 1.4%,

coli bacillus, 3%, gram-negative bacilli, 6%, gram-positive sarcine, 1.4%. Eighty-four operations were performed. Pneumococcus and bacillus coli seem to be particularly dangerous. Pathogenic xerosis bacilli were cultivated from the choroid and retina of an injured eye which finally had to be enucleated. Cultures of conjunctival secretion should always be made before operation. Instillation of sophol 5% is advised as the most effective means of disinfecting the conjunctival sac. The treatment is applied three times daily for several days and the drops rubbed into the tissues by massage.

Discussion: AXENFELD (Freiburg) finds that smears alone give valuable information to a trained observer. The presence of pneumococci in the conjunctival sac is an indication for the administration of anti-streptococcic serum before extraction. ELSCHNIG (Prag) agrees, and suggests pyocyanaze for the practical disinfection of the conjunctival sac. MAYWEG (Hagen) thinks the bacteriological content of less importance than the mechanics of operation, and advises a large conjunctival flap. This has given him but one infection in two hundred cases. KUHNT (Bonn) syringes out the tear sac and irrigates the conjunctiva with oxycyanate solution before operation.

14. ZADE (Heidelberg): **Significance of phagocytosis in corneal infections.** Normal rabbit's cornea contains opsonins for staphylococci and pneumococci, which are not altered during a local infection or general or local immunization. Repeated paracentesis of the anterior chamber, sub-conjunctival injections, and instillations of dionin strongly attract opsonins to the cornea. The stimulation of phagocytosis is of minor inportance. The natural defences, opsonins, are of more practical value than the bacteriotropines formed by immunization.

15. DUFOUR (Nancy): **Cerebral localization of visual phenomena.** The point of stimulation for all reactions in which the two eyes act independently, lies in front of the chiasma, as (1) adaptation, (2) Troxler's phenomenon, (3) fusion of color impressions; while it is back of the chiasm when the two eyes act together, as in (1) illusion of Plateau's spiral line, and in (2) Fechner's paradox. Scintillating scotoma, as observed in his own case, is generally bilateral,

but may be limited to one eye, indicating a possible starting point in the retino-diencephalic neuron.

16. STARGARDT (Kiel): **Ocular affections in progressive paralysis.** Studies of the retina, optic nerves, chiasm, tractus, and lateral geniculate body in 14 cases, including tabes. In this disease we find the final stages, in paralysis the early ones, of simple optic atrophy. The degeneration of ganglion cells in the retina is a secondary process. Both processes are directly due to the spirochæta and not parasyphilitic in any sense.

17. GRUNERT (Bremen): **Etiology of ophthalmoplegia interna.** Report of 12 cases, of which 4 were due to syphilis and were greatly benefited by mixed treatment instituted rather late. Accommodation was completely restored and total pupillary rigidity changed into the reflex form, in one case. Seven cases were due to accessory sinus disease, and were cured by opening up the ethmoid labyrinth. In the rhinogenous cases the short root of the ciliary ganglion is directly involved in the inflammatory process, while in the syphilitic cases we have to deal with an affection in the oculomotor nuclei. Igersheimer, Bartels, Hamburger, v. Heuss, agree as to the rôle of lues in these affections. v. PFLUGK (Dresden) has seen such cases after scopolamin-morphin anæsthesia. LEVINSOHN (Berlin) mentions aplasia of the sphincter as a factor. In closing, GRUNERT mentioned that the diagnosis of nasal disease was generally not made until radiographs cleared matters up.

18. v. MICHEL: **Nature of chalazion.** Refers to Buri's recent claim, based on 2 cases of Unna's, that chalazion has nothing to do with the Meibomian glands but is situated in the loose connective-tissue of the fornix. Michel examined 22 chalazia, all of which were at the middle or near the free border of the lid, and were removed complete with some of the underlying tarsus. In half the cases there was acute inflammation of the Meibomian glands with purulent degeneration of the glandular epithelium, round-cell infiltration, and proliferation. In older forms granulation tissue is produced. Giant cells are found in recent forms as well. The cause is a virulent action of toxins set free by bacteriolysis or phagocytosis of any of the pathological micro-organisms

which are usually found in, or may invade, the conjunctiva sac.

THIRD SCIENTIFIC SESSION, AUGUST 4TH; CHAIRMAN, GALLEMAERTS (BRUSSELS).

19. KRAUSS (Marburg): **Unstriped muscles of the human orbit.** The fibres described by Landstroem in the anterior part of the orbit could not be found by the author, while the depths of the orbit do contain involuntary muscle fibres which are to be considered as a prolongation backwards of Mueller's orbital muscle which acts as an obturator for the inferior orbital fissure. These fibres, hitherto undescribed, form a musculo-tendinous layer, membrana orbitalis muscularis, which spreads out over the petrygo-palatine fossa and is of practical interest in connection with the venous supply of the orbit, especially by the superior ophthalmic vein, and the question of pulsating ex- and en-ophthalmos and varices of the orbit.

20. SATTLER (Leipzig): **The muscle of Landstroem in exophthalmic goitre.** Protrusion of the globe in Basedow's disease was ascribed to hypertrophy of the retrobulbar connective cellular tissue by v. Basedow himself, and of late by G. R. Murray, and to relaxation and stretching of the extrinsic ocular muscles by White Cooper, a theory which seemed to be supported by v. Recklinhausen's demonstration of fatty degeneration in these muscles. In total ophthalmoplegia without ptosis the protrusion is never as marked as in exophthalmic goitre. Aran ascribed the proptosis to continuous irritation of the orbital muscle of H. Mueller, then a recent discovery. But this investigator himself noted that irritation of the cervical sympathetic after decapitation produced decided widening of the lid fissure, but a scarcely noticeable protrusion of the globe. Landstroem has recently described a muscle, which is supposed to be active in causing an actual protrusion, as a cylindrical ring having its origin in the septum orbitale or tarso-orbital fascia and its insertion in the neighborhood of the equator. There is no doubt of the existence of numerous unstriped muscle fibres in this region, as shown by horizontal serial sections through this part of the orbit, especially toward the nasal side. There is, however, no ring to speak of, according to Sattler, who de-

scribes the muscle as arising near the equator from the fascia of the rectus internus or Tenon's capsule, and inserting in the conjunctival cul-de-sac which it probably keeps on the stretch when the eye is markedly ab- or ad-ducted. The topography of these fibres excludes any protruding action on the globe and their superficial situation must expose them to the same action of cocain and adrenalin, instilled or injected, as Mueller's lid-muscle, whose stimulation under these circumstances, as we know, produces no decided protrusion. Accumulation of fluid in the orbit is the probable explanation of the exophthalmos with goitres. Venous stasis does not explain the condition. Congestion of small arteries, like that which causes the blushing often noted in Graves's disease, may be a cause, but this is certainly not marked or we would have pulsatile and auscultatory signs to correspond. The bruit described by Snellen is not a vascular murmur but a genuine muscle-tone. Microscopic examination shows actual fluid in the connective-tissue spaces of the orbit, producing an œdema like that of the lids and lower extremities, also seen quite frequently in exophthalmic goitre. The selective action of a toxin on the cellular tissue of the orbit is exactly paralleled by that of paraphenyl-diamin which causes protrusion of the globe due to an œdema, as shown by Grunert and Birch-Hirschfeld. Post-mortem examinations failed to reveal œdema of the orbit, but the same examinations often show a diminution or complete disappearance of the exophthalmos.

21. M. BARTELS (Strassburg): **Fixational and motor anomalies of the eyes.** Experiments on influence of the labyrinth on ocular motions. Stimulation of one ear causes tonus of all four lateral muscles, resulting in abduction, and causing horizontal nystagmus. The stimulation for the slow phase goes by way of the vestibular nerve. The changes in the muscle during contraction and relaxation act as a stimulus to the sensory end-organs which Tozer and Sherrington have demonstrated in the muscles, and go to the cortex by way of a sub-cortical centre. Thence, the rapid motion is innervated. Graphic registration shows more marked participation by the eye on the side corresponding to the stimulated labyrinth, in both slow and rapid phase. This was confirmed by muscle curves and by noting the excursions of the globe with fine

needles stuck into it as pointers. These experiments on animals are corroborated by Panse's clinical observations during operation, indicating that irritation of a labyrinth affects the two eyes unequally. This would contradict Hering's law of the equal innervation of both eyes under all circumstances. In man, fixation dominates the ear-eye movements, and the lower centres for regulation of ocular movement do not even appear clearly, as might be expected, when fixation is abolished. In the blind there develops a spontaneous nystagmus, opposed, in direction, to that which can be elicited from the labyrinth. Nystagmus in amblyopia is not due to attempts at fixation (P. H. F.?) but to central irritative reflexes which come into action when not inhibited by fixation.

22. BIELSCHOWSKY (Leipzig): **Congenital and acquired enlargement of field of fixation.** Excessive motility occurs as congenital overaction of the inferior oblique. The symptoms are those of trochlearis paralysis. The anomaly is most marked in, and often limited to, the left eye. Traumatic paralysis of the superior oblique by injury to the pulley during operations on the orbit and frontal sinus produce an actual hyperfunction of the inferior oblique which is explained by their relations to Tenon's capsule.

23. ADAM (Berlin): **Ocular disturbances in eclampsia.** Eighty-eight cases of which 40 were visually affected, generally in the form of complete amaurosis of a cerebral, uræmic character, as the pupillary reflexes were not abolished. Blindness generally came on rather suddenly just before loss of consciousness and persisted for hours or days after its return. Normal vision finally was restored in all cases. Only 5 cases showed fundus changes, of a sort which has not been hitherto described. The periphery showed slightly darker choroidal areas on which the vessels stood out very prominently. These areas might almost have passed for normal, but eventually decidedly marked pathological changes took place in them, giving finally the picture of degeneration of the choroidal vessels like the syphilitic or arteriosclerotic type, with pigment atrophy. Microscopic examination showed extensive choroidal hemorrhages with multiple thrombosis of choroidal vessels. Only slight changes of the vessel walls, involving the intima.

24. SCHIECK (Goettingen): **Occurrence of tuberculous antibodies in the aqueous.** The author's experiments in 50 cases of experimental tuberculosis of bovine and human type disprove Alfred Leber's claim that in such cases antibodies are set free in the aqueous. Only when the anterior chamber is flooded with enormous masses of dead bacilli do immune bodies appear in the course of about three weeks. The complement fixation test also failed to reveal tuberculines in the aqueous.

25. HAMBURGER (Berlin): **Channels of ocular fluids.** The anterior chamber is drained mainly through the lymph-spaces and vessels of the iris. Schlemm's canal plays a minor rôle.

26. BEHR (Kiel): **Lymph-channels and currents in the retina and nerve.** Injections of 40 human optic nerves indicate the existence of four main systems of lymph-spaces: (1) The subpial lymph-space surrounding the nerve trunk in the form of a hollow cylinder extending from the globe to the optic foramen, and lying between the pial covering and the peripheral nerve-fibre fascicles. (2) Primary subseptal spaces which, similarly, surround the individual fascicles, occupying the space between them and the primary septa. (3) Secondary subseptal clefts, underneath the finer septa which traverse the fascicles. (4) Parenchymatous lymph-clefts, proper, investing, and in direct contact with, single nerve-fibres. All these clefts correspond closely to the arrangement of the glia fibres in the nerve, indicating that the latter tissue has a nutritive function regulating the flow of lymph. In the retina, only the parenchymatous lymph-clefts can be traced, and injections show a space between neuro- and pigment-epithelium, and between the nerve-fibre layer and the internal limiting membrane. The perivascular lymph-spaces of the central retinal vein represent a separate system which can be injected from the nerve, without, however, filling the parenchymatous spaces of the nerve or retina, or communicating with the vitreous. There is a broad communication with the central parenchymatous spaces where the central vessels pass obliquely to the pial sheath of the nerve. The subpial and other lymph-spaces of the nerve do not connect with the subarachnoid space by way of the pial sheath. All centripetal paths for fluid secreted in the tissue

spaces of the retina or nerve are located within the pial sheath. It is only in the intracranial portion of the optic nerve that communication with the subarachnoid space takes place. There appears to be a communication with the third ventricle at the posterior commissure of the chiasm.

Discussion: SCHIECK does not agree with Behr's theory interpreting choked disk as due to ocular lymph-stasis, and Krueckmann explains quite similar microscopic conditions as artefacts.

27. JUNIUS (Cologne): **Etiology of trachoma.** If the trachoma bodies are merely a product of a toxic action at a distance originating in the epithelium there will be no necessity for excising the trachomatous conjunctiva, a matter of practical importance. He believes that the granules actually contain the trachoma parasites, which have invaded the nucleus. Cell inclusions resembling Leber's crescentic cells and probably of the nature of phagocytes, not of epithelial origin, were generally found.

28. GREEFF: **Present status of the trachoma-body problem.** The morphologic character of the chlamydozoön has not been determined absolutely. The bodies have been found in the normal conjunctiva, more often associated with gonococci, diphtheria bacilli, pneumococci, and staphylococci, and in purulent discharge of swine pest. We cannot accept the existence of an urethral trachoma, of a trachoma neonatorum, or of a special disease form to be characterized as inclusion-blennorrhœa. The granules are probably micro-organisms which are of importance in nature's economy, of widespread occurrence and, as yet, unknown significance.

29. STANCULEANU (Bucharest): **Cataract extraction in the capsule.** Smith's operation is not satisfactory as it often necessitates the introduction of the spatula or spoon into the vitreous, and causes hemorrhage, vitreous opacities, deformity of the pupil, and marked astigmatism. His own procedure is less dangerous and suited for ripe mature cataracts and for very old patients.

FOURTH SCIENTIFIC SESSION, AUGUST 5TH; CHAIRMAN, MAYWEG (HAGEN).

30. KOELLNER (Berlin): **The borderland of normal color sense.** Rayleigh's color equations are the best practical test

as well as the finest for subjects who are still able to pass the tests of Nagel, Stilling, and others. The acceptance of a red-yellow equation does not necessarily imply red-green blindness, as changes in intensity of illumination alter the judgment of the color equation in eyes which are sound for all purposes of color recognition.

31. HERTEL (Strassburg): **Stimulation of the retina by spectral light.** Experiments with fluorescent light and with red rays from the extreme end of the spectrum indicate that the objective changes in the retina following exposure to light, particularly the contraction of the cones, are intimately connected with the visual process.

32. SEEFELDER: **The involvement of the semilunar fold in vernal conjunctivitis.** Three cases are reported in which the fold was markedly involved, disproving Saemisch's statements.

33. AXENFELD: **Special forms of iris atrophy.** Incomplete mydriasis of an apparently normal and non-adherent iris may be due to hyaline degeneration of the pupillary margin occurring generally in blind or degenerated eyes, but also in simple cataract and in normal vision. The clinical picture resembles that of senile atrophy of the posterior pigment layer of the iris, except that the latter leads to whitish gaps in the stroma and the appearance of a nicked or notched pupillary margin. The hyaline deposit was always found on the posterior surface. Another factor of partial dilatation is a diffuse atrophy of the dilatator, appearing as a thinning of the anterior or posterior layers of the stroma. In many cases of this sort there has been an arrest in the physiological transformation of retinal epithelial elements into dilatator cells. The atrophy at the pupillary margin is often associated with senile cataract, keeping pace with the lens changes, and beginning, as do the latter, in the lower half. In cataract as well as in fluidification of the vitreous it is often possible to transilluminate the iris through the sclera.

Discussion: IGERSHEIMER (Halle) noted this form of iris atrophy in three cases of congenital syphilis, and Hamburger believes this condition may explain the unsatisfactory results of iridectomy in chronic glaucoma. Leber refers to the occurrence of connective tissue on the anterior surface of the iris, which frequently escapes observation.

34. LEVINSOHN (Berlin): **Experimental study of choked disk.** Demonstration of an apparatus for injecting given quantities of fluid into the subdural or subarachnoid space. Subdural injections were followed by slight stasis in the anterior segment of the nerve and venous hyperæmia with retinal hemorrhages, but the fluid never found its way along the axial trunk even with greatly increased pressure or after excluding any draining off of the vitreous by preliminary puncturing of the globe. The injected fluid always follows the perivascular lymph-spaces along the central vessels through the dura into the orbit, disproving Schieck's theories. Choked disk is explained as a result of interference with the draining off of vitreous owing to blocking of the perivascular lymph-spaces along the retinal vessels within the nerve sheath, which in turn is caused by the increased pressure of pathologically altered cerebro-spinal fluid. Choked disk is not due to compression of the central vein as stated by Deyl and Knape, as the latter factor leads rather to venous hyperæmia and multiple retinal hemorrhages.

35. GRUETER (Marburg): **Study of vaccine immunity of the eye.** Active constitutional immunization is localized in the anterior chamber and vitreous as well as in the cornea. Local active or passive immunization via the conjunctiva has a still stronger action. Primary infection of the eye, aside from corneal infection, causes general immunity. Antibodies are formed at the site of infection, aside from intravenous application of the virus. Antibodies are found in the anterior chamber and cornea before any irritation has affected the eye. This is increased by subconjunctival injections of irritating 5% salt solution. The vaccine antibody is probably an antitoxin.

36. KUFFLER (Giessen): **Endothelioma of the orbit.** The nature of endothelium and of these neoplasms is not thoroughly understood. The growths are malignant but show little tendency to form metastases. There is marked polymorphy of the tumor elements. The structure may be alveolar, tubular, or retiform. Hyaline degeneration and accumulations of epitheloid cells in concentric layers are common. From the category of endothelioma we must exclude all tumors which develop from true epithelium, *e.g.*, lachrymal gland, as well as all cylindromata.

37. FLEISCHER (Tuebingen): **Microscopic study of simple glaucoma.** Examination of both eyes and nerves of a man of 61 who had been under treatment for over three years for simple chronic glaucoma of the left eye. Not only in this organ but particularly in the right eye, which was still nearly normal ophthalmoscopically, there was found an extensive cavernous atrophy as described by Schnabel, involving the retina about the disk, the prelaminar portion of the nerve, and extending backward for some distance. The disk was normal with a deep central physiological excavation and there was no recession of the lamina. This supports in all details the view of Schnabel that glaucomatous excavation is due to formation of cavities in the head of the nerve and that there is no recession of the lamina depending on increased intraocular tension. This is further borne out (P. H. F.?) by the fact that extensive cavernous atrophy was found in the sound eye where there had been no evidence of glaucomatous tension.

Discussion: ELSCHNIG (Prag) explains the causation of glaucoma by the preponderance of lymph pressure over the tissues tending to contract.

38. MANOLESCU (Bukarest): **Bilateral optic atrophy following malignant pustule.** The anthrax carbuncle was situated on the upper lid and produced a gangrenous area with marked brawny œdema of the face, neck, and thorax. The eyes were closed by the swollen lids, but vision was normal. The treatment consisted in administration of anthrax serum and bichloride compresses. Five days later the inflammatory reaction had subsided and the eyes could be opened, but there was now complete blindness with chemosis and exophthalmos. The retina showed marked œdema with hemorrhages along the veins. Six weeks later the disks were snow-white, sharply defined. No light perception. Pupils widely dilated. Veins almost normal. Central arteries very narrow or entirely obliterated. The picture closely resembles that of atrophy following facial erysipelas and orbital cellulitis and suggests a similar pathology, viz., mechanical compression of the central vessels by the inflamed and swollen tissues in the depths of the orbit.

39. MIHAIL (Bukarest): **Pathological anatomy of the posterior capsule in senile cataract.** Studies based on lenses

extracted in the capsule. The equatorial epithelium covers a small part of the periphery of the posterior capsule where it forms numerous tags. From this margin the posterior capsular epithelium arises. In about 20% of the cases, the epithelium is limited to the marginal region, while in the rest it entirely covers the back of the posterior capsule. The epithelium is quite irregular, especially at the posterior pole, where the large endotheloid or fusiform cells have a tendency to form in groups. After-cataract can best be avoided by removing the anterior capsule complete with forceps without teeth (Manolescu) or by extraction in the capsule.

40. HOLTH (Christiania): **New operative treatment of detachment and high myopia.** Subconjunctival excision, with Bowman's trephine, of a disk of sclera 2.5*mm* in diameter, about 12*mm* back of the limbus, without injuring the choroid. No subretinal fluid is evacuated. The patients are kept in bed for a week. Seven cases are reported. Tension remains low (10–15*mm* Hg. Schioetz) for weeks or months. The normal anterior chamber does not become deeper. The detachment invariably became smaller, and in two cases disappeared, but even in these cases vision was hardly improved although the fields were decidedly enlarged. In three cases, high myopia was reduced from an average of 15 D. to about 7 D. The volume of these eyes became evidently less. The "exophthalmos" diminished, indicating a decrease in size of the antero-posterior axis. One case of myopia of only 6 D., the first operated, remained unchanged, but here the scleral disk removed was only a little over 1*mm* in diameter. Post-operative irritation, cyclitic or other uveal complications were not observed in a single case. Two cases of extreme myopia without detachment were also operated. In one, the refraction went down from 17 D. to 6 D. in three weeks, but vision remained $\frac{5}{36}$. Field of vision which had been normal seemed somewhat larger. In the second case myopia of 24 D., was reduced to 20 D. in three weeks. The effect of the operation is to be explained by the seeping out, during the first few months, of suprachoroidal lymph through the trephine opening into Tenon's capsule. This increases the absorption capacity of the choroid. Simultaneously, the thin-walled myopic eye yields to the traction of the extrinsic

ocular muscles and becomes shorter. The important rôle played by these muscles is suggested by a case in which myopia of 18 D. was reduced only 2 D. during the six weeks the patient remained in bed, and then fell to 8 D in three weeks, while the patient was up and about. Rest in bed with the eyes unbandaged is decidedly useful.

41. ROEMER AND GEBB (Greifswald): **The question of anaphylaxis.** Tests of Krusius's experiments with albumen of the lens, leading to quite different conclusions. This substance must not be considered as in a sense alien to the organism. Guinea-pigs treated with homologous lens albumen do not become hyper-sensitive to this substance and produce no anaphylactic antibodies whatsoever. The latter are produced, perforce, by the substitution of heterologous albumen. The nucleus of the cataractous lens contains less albumen antigen than the normal lens. The criterion of these reactions was the fall of temperature in 3000 measurements.

Discussion: KRUSIUS notes the importance of quantitative data and of various sub-febrile reactions, advising caution in the interpretation of apparently negative results based only on a fall of temperature. Albumens can undoubtedly act biologically as foreign, *i.e.*, toxic substances even in the original organism. This has been proven of testicular as well as of lenticular extract. ELSCHNIG (Prag) corroborated this statement of the antigen action of "native" albumen for the uvea and ocular pigment.

42. PASCHEFF (Sofia): **Hæmatopoetic function of the conjunctiva.** A common and special function of the conjunctiva consists in the production of follicles with germinative centres. In chronic, gravely pathological processes large granulations are produced, consisting of numerous solitary or aggregate follicles, representing true trachoma. This is analogous to other mucous membranes and especially that of the pharynx with its adenoid hyperplasia. Another form of conjunctival hyperplasia is characterized by production of lymphocytes and plasma cells. Solitary lymphomata of leucæmic or pseudoleucæmic character are also found, as in such other sites of lymph-tissue formation as the spleen, lymph glands, and mucous membranes, or, as in their case, the conjunctiva may participate in a general affection of the lymphatic system.

Eosinophile cells as well as mast cells are also produced in the conjunctiva.

43 VAN DER HOEVE (Utrecht): **Imbibition heat of lens matter.** The thermic energy set free by ox lens matter in absorbing water amounts to 13.3 gram calories for each gram of dry substance, in water, somewhat less in "native" aqueous or vitreous. The iodides diminish these figures.

REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

An ordinary meeting of the Society was held at the rooms of the Medical Society on Thursday, October 19th. The chair was occupied by Mr. J. Bowring Lawford, the new President.

The following cases were shown. By Mr. George Coats, two cases showing **a small superficial opaque ring in the cornea.** Mr. Coats thought that if it was not a deposit, it must be a congenital opacity. He had seen another case of the same kind. Mr. Bishop Harman demonstrated a new **photometer** for school doctors, a portable and simple instrument whereby an exact knowledge of the amount of light existing in schools—without relying on the uncertainties of personal estimates—could be obtained in candle power, that of the ordinary London sperm candle. Lieutenant-Colonel Pisani showed a case of **cyst of the iris;** and Major Mould, a case of **vaccine pustule in the eyelid.** Mr. Greeves's case was one of **tumor of the ciliary body,** in which there was recurrence after removal. Neither caustics nor the application of CO_2 checked its growth. Dr. Greenfield showed a case of **unilateral optic neuritis in a case of disseminated sclerosis.**

After the formal presentation of Vol. XXXI. of the *Transactions*, the President delivered his Introductory Address. After referring to his election as President, in a few graceful and grateful phrases, Mr. Lawford proceeded to deal, in considerable detail, with the subject of **vaccine therapy,** passing in review the work of many continental and British

investigators, and then went on to refer to their bearing on the treatment of eye diseases. He concluded by a reference to immunity, active and passive, and to the prospect of success in eye diseases. Sympathetically appreciative allusion was made by the President to the decease of Dr. HUGHLINGS JACKSON, one of the original members of the Society, and to the fact that he was one of the earliest physicians to insist on the importance of ophthalmoscopic examination in diseases of the nervous system. The President closed the reference by a warm eulogy on Dr. JACKSON'S personal and professional attributes.

The first paper was by Mr. J. S. MANSON (of Warrington) entitled **A case of hereditary cataract,** and was communicated by Mr. E. Nettleship. It was a case of hereditary lamellar **cataract** occurring in four consecutive generations, affecting thirteen persons (six males and seven females) and transmitted in all cases by females who were themselves affected. Three members of the pedigree, in three different generations, had a congenital deformity of the little fingers, which appeared to have been independent of the cataract, for only one individual showed both the digital and lenticular abnormality.

The other paper was by Mr. NETTLESHIP, and was entitled **A new case of hereditary night-blindness.** It was the form without ophthalmoscopic changes, in which the abnormality was associated with myopia, and descended, as in color-blindness and several other conditions, through females themselves normal. Twenty cases had been discovered in this extensive genealogy. Photometric records and field measurements of several were recorded; in one there was a partial ring scotoma. Several members of the pedigree were myopic without being night-blind, and several (some of them night-blind, others with normal sight) were mentally affected. There was only one consanguineous marriage in the entire pedigree.

An ordinary meeting was held on November 9th, Mr. J. B. LAWFORD, President, in the chair.

ELECTION OF HONORARY MEMBERS.

The President announced that some time ago the Council

determined to propose three names of gentlemen for Honorary Membership: the late Dr. Hughlings Jackson, Sir Jonathan Hutchinson, and Dr. Landolt, the Bowman lecturer of last summer. The result of the ballot was the unanimous election of Sir Jonathan Hutchinson and Dr. Landolt.

CARD SPECIMENS.

Mr. FOSTER MOORE showed a case of **bilateral angioma of the retina.** The President asked whether Mr. Moore thought the title was quite accurate. He asked because he would have thought that what could be seen were retinal vessels which were unusually dilated. Mr. Foster Moore replied that there was a very large artery going to it, and a large vein coming from it. Mr. HUGH THOMPSON showed a case of **second orbital endothelioma** occurring eleven years after removal of the first. He said he regarded it rather as a fresh growth than as a recurrence of the former one. Mr. L. J. C. MITCHELL showed three cases of **rodent ulcer which had been successfully treated by means of carbon dioxide snow.** The President regarded them as very good examples of the successful use of the method. Mr. N. BISHOP HARMAN showed a case with **dislocation of the lens in the posterior chamber due to an accident eighteen months before.** The vision had remained excellent. Mr. WRAY showed a new model of a **Placido disk and retinoscopic lenses.**

Professor STRAUB read a communication on the **Pathology of dust-like opacities in the vitreous body and of Descemet-dots,** and it was supplemented by an epidiascope demonstration. He said that among the diseases of the eye there should be recognized an inflammation of the vitreous body, which he proposed to name "hyalitis." He injected into the vitreous body of the rabbit some pathogenic microbes. Those microbes made the culture there and only there, and attracted to the vitreous body serum and leucocytes. The serum and leucocytes were produced by the vessels of the ciliary body, but that was not a reason to talk of cyclitis in cases of inflammation of the vitreous body. He likewise injected into the ciliary body pathogenic microbes, and to those went serum

and leucocytes, and there was produced a real cyclitis, quite different from the hyalitis which he had in the first experiment. In the laboratory hyalitis could be distinguished from cyclitis, and the same distinction should be made in practical work. But that had not yet been done. The two diseases were mixed up in the text-books. The books said the ciliary body poured out its exudate into the vitreous body, but that was a mistake, as leucocytes did not allow themselves to be poured out. Metchnikoff said that leucocytes only went where they were attracted by chemotactic substances. When there were microbes in the vitreous body, those substances went towards the vitreous body; when microbes were in the ciliary body the leucocytes went to the ciliary body. He had, in order to test the matter, tried to produce inflammation of the ciliary body, by infecting the ciliary body with tubercle bacilli, causing in that way granuloma. He then made sections to see whether the vitreous was clear. He thought it was clear, with the exception of a few leucocytes here and there. But when making sections through the eye he found that the optic nerve was somewhat swollen, and that in its cup there were many leucocytes, and those were projected on to the immediate adjacent retina. So he concluded that tuberculous granuloma in the ciliary body had the power to cause a very slight inflammation of the optic nerve on the other side of the eye. The lymph stream in the eye went from the ciliary body to the optic nerve, and took with it some toxines which were produced by the granuloma. Those experiments were made twenty years ago. He did not feel satisfied with his method of infecting the ciliary body, therefore eight years ago he recommenced, with a colleague, a new series of experiments, in which a thread charged with tubercle bacilli was passed through the ciliary body, through the sclerotic, and through the superficial layer of the ciliary body, and brought out into the sclerotic again. The thread was cut at the points of entrance and exit, so that there remained in the ciliary body a piece of thread 3*mm* long, and after ten to fourteen days a granuloma commenced. Some weeks later the eye was extirpated and sections made, and he found the same things as in his experiments twenty years ago. He showed colored photographs exhibiting the points he

had mentioned. The dots were caused by groups or heaps of leucocytes. Among fourteen cases of dust-like opacities only one was syphilitic, nine were tuberculous, and the remainder he did not know the nature of. It was quite clear that Descemet's dots were groups of leucocytes. The vitreous body, he felt sure, obtained no leucocytes from the cornea; in inflammation of the vitreous body the leucocytes came from the ciliary body.

The President thanked the Professor for his able exposition, based upon prolonged and numerous experiments. Mr. TREACHER COLLINS asked how the leucocytes which died got to the back of the cornea in the first place. Mr. HERBERT PARSONS said he understood Professor Straub's contention to be that the leucocytes were carried forward in the lymph stream, and his explanation of the formation of the dots was a very ingenious one. But the speaker criticised the use of the terms "hyalitis" and "Descemetitis," as he regarded their use as backward steps in pathology. The tissue under discussion was non-vascular and apparently passive, whereas inflammation was pre-eminently an active process. He had hoped the Professor would have supported the view which he, Mr. Parsons, had hypothecated, that where there were dust-opacities in the vitreous, associated perhaps with choroidal change, there was really a low grade of cyclitis going on to account for the presence of those opacities, and that they were not due to any inflammation present in the vitreous *per se.* Supporting that view was the fact that in cases of choroidal inflammation there was no transference of leucocytes or organisms directly from the choroid into the vitreous until the membrane was burst through. Mr. W. H. JESSOP said the Professor did not appear to have made quite clear what he understood to be the difference between hyalitis and cyclitis. He had been much interested in the demonstration of leucocytes in the cup of the optic nerve, and the slight degree of papillitis. That was particularly interesting because one often felt there must be some papillitis because of the degree of swelling.

Professor STRAUB replied, affirming his belief in his ultimate power to convince ophthalmic surgeons of the truth of his thesis when he came to publish the full results of his work.

He relied for the acceptance of his views upon a combination of the histological and clinical material which he had collected.

Mr. A. W. ORMOND read a paper on **Ocular conditions found in Mongolian idiots.** He had examined a number of these cases at Earlswood and Darenth Asylums, at the Evelina Hospital, and elsewhere, in all forty-three cases. He described the facial and physical traits. They had a certain liability to particular diseases. Over 50% had a defect in their lenses, and almost all had some ocular defect. Sometimes Mongolians could be recognized as early as the second year. When seen later they were short of stature, due mainly to the shortness of the limbs. The head was round and the occipital protuberance of the skull ill-developed. The hands were small and the thumbs squat, the little finger being incurved. The foot was flat, and the subjects often sat tailor-fashion. They had a difficulty in pronouncing certain consonants. They were imitative, fond of music, and affectionate. Most of them died from tuberculosis, and they did not often attain adult life. There was almost constantly some ocular trouble present—blepharitis, ectropion, squint, nystagmus, or lens opacity. Blepharitis and conjunctivitis might be primarily due to dirty habits, and might be kept up by uncorrected errors of refraction. A more certain cause of the inflammatory condition of the lids was a dry, glazed condition of the skin of the lower lids, which, by its contraction, caused a slight degree of ectropion. In more than 50% of his cases, some form of lens opacity was present, and with such a high proportion it might be regarded as an aid to diagnosis. The cataracts were of the incomplete form, and most of them of the "dot" variety, in the position common for lamellar cataract. These dots when slight were often translucent, and so could not be seen by transmitted light. The opacities did not reach to the periphery of the lens in any direction, and consisted of numerous small discrete dots. The posterior pole of the cataract was often marked by a star-shaped opacity. Though the teeth of these people were defective, they did not show the honeycombed condition so frequent in cases of lamellar cataract. Mr. Ormond could not record accurately the visual acuity, as the children were not sufficiently controllable to be trusted with glasses. The youngest of the

patients showing cataract was aged six and one half years, and the oldest forty-three. Mongolian imbeciles were, in many cases, the children of old parents, or the last child in a large family. Of his forty-three cases, thirty-two were males, and ten females. The average was fourteen and three fourths years. Twenty-three had the interpalpebral fissure directed upwards and outwards, five had nystagmus, nine had squint, eighteen had either blepharitis or ectropion, or both, eleven had epicanthus, and twenty-five had some lens opacity.

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By the Late Dr. E. B. COBURN, Secretary.

MEETING OF MAY 15, 1911. DR. H. W. WOOTTON IN THE CHAIR.

Dr. L. W. Crigler presented a case in which he had performed **a downward iridectomy in both eyes in a case of lamellar cataract.**

Patient, A. E., female, age 46. Has always had poor vision, so far as she remembers. Had rachitis when quite young, with defective teeth. Was seen when 16 years of age in London and told that she had lamellar cataract. No treatment was advised. She has consulted several oculists from time to time but no treatment or operation was advised save the prescribing of glasses for slight myopia.

When seen by me vision in right eye with correction was $\frac{20}{70}$; left eye $\frac{20}{100}$; near work almost impossible on account of central opacity and a contracted pupil.

On dilating the pupil it was found that the opacity seemed stationary and circumscribed, there being no opaque sectors. Vision was improved to $\frac{20}{40}+$ in right eye and $\frac{20}{40}-$ in left; Jaeger No. 2 with right and No. 3 with left with proper correction.

Iridectomy downward and inward in both eyes was done and the patient's distant and near vision is practically as stated above, with pupils dilated. She is a baby's nurse and says that she can now make out with ease the markings on the thermometer. She sees better than she ever remembers having seen. She suffers some from dazzling when in the

bright sunlight, but this has been removed by the prescription of chlorophile lenses, medium tint.

In the discussion which followed, Dr. POOLEY stated that he had supposed that iridectomy for lamellar cataracts was a thing of the past. He thought that nowadays they were very generally extracted. Iridectomies would tend to embarrass a patient, and extraction usually resulted favorably. Dr. GRUENING did not think that iridectomies were a thing of the past, and stated that he performed them in suitable cases, especially when the periphery of the lens was clear, for in such cases the patient, if not presbyopic, was able to read without glasses. In one case he had performed an extraction in one eye and an iridectomy in the other. Dr. WEEKS agreed with Dr. Pooley, and had been embarrassed in such cases in attempting to remove the lens by the downward direction of the iridectomy. In children he needles; in adults extracts. Often after an iridectomy we might have to perform an extraction later, as the periphery of the lens frequently becomes opaque in later life. Downward iridectomy was in an awkward position and to be compelled to perform an additional upward iridectomy would be unfortunate. Dr. SCHIRMER thought the choice of operation should depend upon the size of the cataract. If small, and atropin gave good vision, he would perform an iridectomy; if an iridectomy had already been performed he could, however, perform an extraction without making another coloboma. The iridectomy should be small. Dr. CRIGLER stated that the patient sees better now than when 16 years of age. Both distant and near vision were better after the iridectomy, and the patient has preserved her accommodative power. Dr. GRUENING stated that he has a patient, now 45 years of age, upon whom he had performed an iridectomy for lamellar cataract thirty-five years ago. The child of this patient also has lamellar cataract, and Dr. Gruening intended to repeat the operation.

Dr. H. H. TYSON presented a case of **keratitis which he had presented at the March meeting, and which had since been treated with six injections of tuberculin.**

Dr. H. H. TYSON also presented a case of **nævus of the lid with hypertrichosis.**

The patient was a Russian girl, F. G., age 19, with nævus

pigmentosa with hypertrichosis located at the left side of the nævus, involving the skin surrounding the left eye on all sides except temporally, and the caruncle was also pigmented. The eyelashes were intensely black, coarse, and long, while the left eyebrow was very heavy with long flowing hair resembling a small portion of a horse's tail. She had been treated at various clinics during the past three years, having the coarse eyebrow removed with paste, but with a recurrence after each application.

The nævus had been treated with various acids which had apparently produced some bleaching of the part. As a number of cases in which acids have been used have later had keloids occur, he does not favor their use in these cases, but intends using carbonic acid snow for the nævus and removing a number of the coarse hairs from the brow by electrolysis, leaving a brow of normal appearance.

Dr. OTTO SCHIRMER presented a case on which he had performed an **optico-ciliary resection for secondary glaucoma.**

The patient, a woman of 57 years, was suffering from a secondary glaucoma with severe pain. In addition to the symptoms still visible, *i.e.*, leucoma of the cornea, posterior synechiæ, cataract, absolute blindness for years, there were present injection, haziness of the cornea, and increased tension, besides a very shallow anterior chamber. The left eye did not show objective changes, although the patient complained of dimness and pain on this side.

As no lasting relief is obtained, as a rule, in these cases of old absolute glaucoma either by iridectomy or by cyclodialysis, I resolved to perform resection in order to avoid enucleation. I performed it in the way I always do, without preliminary tenotomy, by advancing between the internal and inferior recti. After a conjunctival section I introduced a pair of scissors to the point of the orbit and cut the optic nerve. Then I turned the eyeball so that the nerve was directed forward, separated all the ciliary nerves on the posterior half of the globe, cut the optic nerve a second time near the sclera, turned the eyeball back, and sutured the wound. There was moderate exophthalmos due to retrobulbar hemorrhage.

The healing was normal but for some paresis of the internal rectus due to overstretching during the operation, but the

muscle recovered gradually and now has regained its motility nearly entirely. The divergent strabismus was present before the operation, depending upon the amaurosis. The symptoms of glaucoma and the pain have disappeared, although the tension is still above the normal—37*mm* of Hg. with Schiotz's tonometer. Four months ago the left eye suffered from a sudden attack of acute glaucoma. It was very red for a few days but with instillations of eserin-oil it recovered its old vision of $\frac{20}{40}$, field and tension being normal, 17*mm* of Hg. This quick recovery, as well as the absolute lack of irritation in the right eye, proves that there is no connection between this glaucoma and the condition in the right eye.

In the discussion which followed, Dr. WEEKS asked how severe had been the reaction. Cases had been reported followed by suppuration. Dr. GRUENING stated that Schweigger recommended this operation and had performed it with good results, but it has not been done much of late. Schweigger operated by dividing the external rectus. In two cases in which the operation was performed the eye had to be removed later, and he had not performed it since. Dr. SCHIRMER stated that hemorrhage has not been severe, and exophthalmos subsided in about two weeks, but he has known it to be necessary to stitch the lids together. He had once seen Schweigger remove the eye.

Dr. WILLIAM CARHART presented a case of **tumor of the orbit.**

The patient was a young girl, A. S., aged 14 years. About five years ago she fell striking her head and inflicting a lacerated wound over her left eyebrow, which accounts for the scar now seen in that region. Some time afterwards, she claims, the present tumor made its appearance, which has grown more rapidly during the past eighteen months than previously. Recently the left eye has been sore and vision poor. She has been treated at the Manhattan Eye, Ear, and Throat Hospital for keratitis of the left eye, with subsidence of the acute symptoms. She says she has had some intermittent headache; no pain in the eye itself, and no cerebral manifestations. Vision in left eye is $\frac{20}{100}$. By the ophthalmoscope no change of any kind seen in the fundus and tension of the globe is normal. The eye is considerably exophthalmic and there is

some limitation of movement upwards, but none downwards or laterally.

On inspection and palpation a soft mass is felt beneath the upper lid to the outer angle which seems to have some connection with the lachrymal gland, possibly displaced downwards. There is a manifest hard protrusion or growth of the bones of the orbit and frontal region, extending for some distance above and to the outer side of the orbital cavity. This growth gives the entire face an asymmetrical appearance. A skiagraph taken in the laboratory of the Manhattan Eye, Ear, and Throat Hospital shows plainly a shadow extending from the frontal sinus region of the left side of the face outwards and upwards over the external wall of the orbital cavity.

In the discussion of this case, Dr. LESHURE asked whether the accessory sinuses had been examined. Dr. Carhart replied that they had, but nothing had been found, although there had been history of discharge from the nose. Dr. WEEKS thought such tumors were usually sarcomatous. Dr. POOLEY states that osseous spiculæ occurred in some. He recommended removal. He had seen some lives prolonged and the deformity relieved. It was curious that sight was so poor with negative fundus findings. Dr. Carhart stated that keratitis had existed at the time of the fundus examination, interfering with it very greatly. Dr. COHEN asked whether there was any infiltration of the lachrymal gland. Dr. Carhart stated that the gland protruded with the lid everted, so that the gland was either involved or enlarged.

Dr. JOHN M. WHEELER presented a case of **hole in the retina with laceration of the choroid of traumatic origin.**

The patient, G. L., is a boy 13 years of age. He has always had good health. Father, mother, brothers, and sisters are in good health, and all have good vision. The patient and other members of the family are confident that he had good vision in both eyes until about three years ago, when the left eye was struck by a stone.

On May 2, 1911, the patient came to the office complaining of poor vision in the left eye and of the fact that it turned out slightly. Present condition: Vision O. D.-25 sph. $\bigcirc -50$ cyl. ax. 90, $\frac{20}{20}$; O. S. $\frac{10}{200}$, not improved by lenses.

O. S.—small absolute central scotoma, with very little distortion of images. Media are all clear. Left pupil slightly larger than right. There are two very small notches in pupillary margin of iris, but iris reacts to light.

My interpretation of the fundus picture is that the lesion at the fovea is a "hole" in the retina. There is a rupture in the choroid with accompanying deposition of pigment to temporal side and below papilla. There is an area which appears somewhat cone-shaped, with its apex near the temporal margin of the lesion in the macular region, which may represent a thinning (stretching) of the choroid without actual rupture.

I submit a very truthful picture of this unusual condition which Dr. George Young has made with painstaking care.

In the discussion which followed, Dr. WEEKS stated that it presented peculiar features. The defect of the retina was different from the ordinary. The pigment layer of the retina was preserved but was attached to the choroid. The whitish area might be the remnant of cicatricial tissue.

Dr. H. W. WOOTTON presented a case upon which he had performed **advancement of both externi for convergent strabismus** ten years previously.

The patient had good vision in both eyes; binocular fixation, binocular single vision, and could overcome a 70 prism. In abduction the power of convergence was difficult. Not much disfiguration had been produced by the operation, although upon close inspection the site of the advancement was distinctly visible.

Dr. N. J. HEPBURN presented a specimen exhibiting **ossification of the choroid, which had followed a cyclitis and choroiditis which had occurred many years previously, following an injury.**

The eye was hard when enucleated and a section of the globe had to be performed with a nasal saw, after decalcification. The report of findings will be submitted later.

Dr. POOLEY stated, in the discussion, that there were few cases following injury in the literature. He stated, however, that he had seen, in cases of sympathetic irritation and sympathetic ophthalmia, ossification of the choroid after enucleation of the exciting eye. Dr. WEEKS confirmed Dr. Pooley's statement. He also had seen a case in which irri-

tation of the other eye had followed ossification of the choroid and this has led him to recommend enucleation in such cases. Dr. SCHIRMER stated that he had collected the literature on this subject and had discovered reports of a number of cases.

Dr. WEEKS presented a resolution on the death of Dr. Charles Stedman Bull. It was moved, seconded, and carried that a copy of the resolution be forwarded to the family of the deceased, and that the resolution be spread upon the minutes of the meeting.

Dr. A. DUANE read a paper entitled **Description of methods of prismatic exercise,** and printed copies of the method which he employed were distributed to the members of the Section. In explaining these copies Dr. Duane said:

In prescribing muscle exercises for home use it is convenient to use a printed form which is given to the patient and which contains full and explicit directions for his guidance. This saves a good deal of verbal explanation, and often serves to prevent mistakes. The form which I have used for a number of years, and which I have found quite satisfactory, is as follows:

It will be seen that there are four exercises, distinguished by the letters A, B, C, and D. One or more of these exercises may be ordered, according to the requirements of the case, the things which the patients are not to do being crossed out, just as we cross out the forbidden articles on a printed diet list. So, too, the blanks in the last paragraph are filled in to suit the requirements of the case, and any additions to the directions, or any modifications that may seem necessary, can easily be written in in the proper place.

It will be noted that all the apparatus that the patient will need to buy is the three prisms. (In some rather rare cases one or two prisms of a strength other than those noted may be required.) The targets the patient can easily make for himself.

Exercises A, B, and D are used in cases of exophoria. In cases of divergence excess, in which there is marked exophoria for distance, with high diverging power, all three exercises are used. If the exophoria is more marked for distance than for near and the converging power is perfectly normal, special stress is laid upon exercise A. This is particularly the case if there is a tendency to crossed diplopia at distance. In

some cases of this sort it may even be advisable to omit exercises B and D. On the other hand, exercises B and D must be pushed in proportion as the element of convergence insufficiency predominates. In such cases the exophoria for near is greater than for distance and the convergence near point has receded too far from the eyes. In cases of pure convergence insufficiency in which there is little or no exophoria for distance, and the diverging power is often actually subnormal, I generally prefer to omit exercise A altogether. In fact, when the diverging power is low, exercise A may do positive harm.

In some cases of convergence insufficiency exercise D alone may accomplish all that is desired, but, as a rule, needs to be supplemented by exercise B.

Exercise B, and particularly exercise A, should be avoided if there is a tendency to spasm of accommodation, as both may tend to aggravate this condition. Per contra, they are of distinct value in cases of subnormal accommodation, particularly when associated with convergence insufficiency. In such cases I am accustomed to combine these exercises, in which both eyes are made to converge strongly, with exercises of the accommodation, in each eye separately, by making the patient focus with all his might upon the hair line of the accommodation disk (described in the *Ophthalmic Record*) which is brought as close as possible to the eyes.

Exercise C is used for practising the divergence in cases of convergence excess. It is also used for offsetting any excessive effects produced by exercises A and B. For example, if a patient, immediately after doing exercise A, develops a temporary homonymous diplopia, he should forthwith practise exercise C, until the diplopia disappears. In the rather rare cases of combined divergence and convergence insufficiency, exercise C should be regularly combined with exercise B, and exercise A should be omitted altogether. Exercise C may also be employed in cases of spasm of accommodation.

The patient should fully understand the directions given under the head of "Order, Duration, and Frequency of Exercises." In laying down directions as to total length of time during which the exercises should be kept up, the physician must be guided by the conditions present and by the progress

of the case. In order to do this he must see the patient from time to time, both to satisfy himself that his orders are complied with, and also to note the advances that have been made and any resulting improvement in the symptoms. As a general rule, four to five weeks are required to produce the best results in cases of convergence insufficiency and the patient should be able to overcome with prisms, base out, an aggregate amount of at least forty-six degrees. If the patient acquires this facility in this time, I usually direct him to omit the practice for four weeks. If at the end of this period he can still do it as well as when he left off, he can let the matter rest for another four weeks, and then try the exercise again. In other words, he is to see to it by tests made at regular intervals that he keeps in practice.

In the discussion which followed, Dr. WOOTTON asked if Dr. Duane now believed that he could increase the diverging power by prismatic exercise. Dr. Duane replied that he could not. Dr. LAZYNSKY wished to know whether the methods were beneficial in cases of paresis of an ocular muscle, and also whether Dr. Duane found the stereoscope of any value in such cases. Dr. Duane stated that these methods were not indicated in paresis except in those cases where they were themselves on the way to recovery. He had found the stereoscope of no service in ocular palsy.

Dr. A. DUANE presented the following resolution upon the death of Dr. Herman Knapp.

"In commemoration of our late colleague and fellow-member, Dr. Herman Knapp, we, the members of the Section on Ophthalmology of the New York Academy of Medicine, hereby place on record the following minute:

"In Dr. Knapp we recognize a man of genius—distinguished alike as an investigator, teacher, author, clinician, and operator.

"We honor his memory for the many fundamental contributions that he made to our science during over half a century of its most active progress. One of the pioneers in physiological optics, he contributed largely to the theory of astigmatism and accommodation; and later made numerous substantial additions to our knowledge of ophthalmoscopy, clinical ophthalmology, and the pathology and surgery of the eye.

"In particular, as Americans we gratefully appreciate the profound influence he exerted, for nearly fifty years, on the development of ophthalmology in this country by his clinical teaching, by his papers and discussions before societies, by the school and hospital which he founded and of which for so many years he was the sole executive, and by the ARCHIVES OF OPHTHALMOLOGY and OTOLOGY which he established and edited and to which he was a frequent contributor.

"We testify to the help that so many of us have gained from the stimulus of his example, the breadth and depth of his knowledge, and the wealth of his experience.

"We hold in remembrance his qualities as a man—his indomitable energy and enthusiasm; his untiring industry; his single-minded devotion to science; his open-mindedness and uniform sincerity and honesty; his singular lack of ostentation; his goodness to the poor; and his kindness to his colleagues.

"We direct that this record be spread upon our minutes and that a copy of it be sent to the family of the deceased."

Dr. POOLEY seconded the resolution and spoke also of his long association with Dr. Knapp as his first assistant, and stated that his remarks were not simply eulogistic but were matters of fact. Dr. GRUENING also told of his association with Dr. Knapp, and called for the passing of the resolution by a rising vote. The resolution was unanimously carried.

Dr. C. B. MEDING read a paper entitled **Dr. Herman Knapp —An Appreciation.** This paper has appeared in full in the ARCHIVES OF OPHTHALMOLOGY, Vol. XL., No. 5.

Dr. H. W. WOOTTON read a paper entitled **Divergent strabismus with divergence excess as its essential muscular anomaly.**

He dealt with those cases of divergent strabismus which were as a rule associated with hypermetropia either of one or both eyes, and had divergence excess instead of convergence insufficiency as their underlying muscular error.

He believed that such cases might be secondary to a vertical latent deviation, either congenital or due to a paresis or to a faulty insertion of one of the vertical muscles. He stated that such cases were common in New York City, and were much more frequently seen than the cases of divergent strabismus associated with myopia and a convergence insufficiency.

The proper treatment consisted of a tenotomy of both externi as this produced excellent results in such cases and there was no danger of producing an over-effect, as the tenotomies should be free, and performed after exposing the muscle. External rotations in these cases were frequently enormously in excess. Some conjunctival tenotomies did not produce sufficient result.

He showed one case associated with hypermetropia in one eye and myopia in the other. The myopic eye had very poor vision. The operation had been performed several weeks before, and the result was excellent.

Dr. L. W. CRIGLER showed a case of **divergent strabismus due to the same cause, but associated with myopia in both eyes.** With correction of the myopia, had good vision, and tenotomies of both externi had produced binocular fixation for all distances.

In commenting on this case, Dr. WOOTTON stated that divergent strabismus due to a divergence excess and associated with myopia in both eyes was of extreme rarity. He could remember having seen but one other case. Dr. GRUENING stated that in 1891 he had recommended tenotomy of the externi in cases of divergent strabismus. He had also called attention to the fact that these cases were, for the most part, cases of anisometropia. Dr. POOLEY stated that he had employed this method in cases of divergent strabismus, and stated that he recommended it. Dr. DUANE stated that he regarded divergence excess as a frequent condition, constituting perhaps forty per cent. of the cases of the exophoria. It is sometimes a factor even when the exophoria is apparently due to insufficiency of the interni. For example, in many cases of divergent squint, developing after tenotomy of the interni, the squint is evidently the result of an active divergence, not of a passive relaxation or a weakness of the divided muscle. He could corroborate Dr. Wootton's experience that divergence excess was in some cases secondary to a vertical deviation, which latter was not infrequently congenital. In such cases the patient involuntarily tries to make the diplopia less troublesome by actively diverging the eyes and hence throwing the double images as far apart as possible. In operating, Dr. Duane thought that, to get the best results, one should

produce an immediate over-correction with homonymous diplopia and some limitation of movement in the tenotomized externus. Dr. Gruening stated that, in judging which operation should be performed in divergent strabismus, for clinical purposes the reflex test of Hirschberg was convenient. If by this test the divergence equalled 200 metres, a double tenotomy was sufficient; if the tension was greater it would be necessary to divide the muscle behind the tendon. You can control the effect as you proceed. Dr. Crigler asked Dr. Gruening if he made the resection of the muscle. Dr. Gruening replied that he had. Dr. Wootton, in closing, preferred a free tenotomy.

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE BRITISH MEDICAL ASSOCIATION.

By Mr. C. DEVEREUX MARSHALL.

(*Continued from Page 654, Vol. XL., No. 6.*)

MEETING OF THURSDAY, JULY 27, 1911. HENRY EALES, M.R.C.S., PRESIDENT, IN THE CHAIR.

DISCUSSION ON THE ÆTIOLOGY, DIAGNOSIS, AND TREATMENT OF CONCOMITANT SQUINT AND HETEROPHORIA. OPENED BY MR. CLAUD WORTH (LONDON).

Mr. Worth said that any historical survey would be out of place, but the names of four great workers in this field would be in everyone's mind—Donders, Javal, Priestley Smith, and Maddox.

Convergent squint. In a normal-eyed person, the two sets of visual impressions received by the two eyes were fused in the brain into one picture. In order that fusion might take place, the direction of the visual axes must correspond. The cerebral faculty of fusion determined the effort of the oculo-motor apparatus to this end. When that faculty was perfect, even gross displacement of the visual axes produced by prisms could be overcome, so a want of balance of the motor apparatus would not cause squint, but heterophoria. If the fusion faculty was temporarily in abeyance, *e.g*, when one eye was covered, the eyes would deviate. In hypermetropia there was a tendency to excessive convergence during accommodation, but in the interest of binocular vision this was checked. In forcible deviation, as in paralysis of the external rectus,

there was persistent diplopia. Contrariwise, in the absence of the fusion faculty there was no reason for accord in the visual axes, and any disturbing factor—hypermetropia, motor defect, and mental disturbance—caused squint. The controlling factor was referred to the brain. Further than this one could not go.

1. The onset of squint was most frequent in the second and third year. He thought that some fusion faculty was present and effective until some particular strain, illness, or school rendered it insufficient in the faces of ocular difficulties. The belief that squint was determined by motor difficulties was negatived by such cases of motor imbalance, even to fifteen degrees, continuing without squint. Considering the amblyopia of squint, he held that at least ninety per cent. of amblyopia in squinting eyes was acquired. In the rare cases of amblyopia without squint there was usually a high degree of astigmatism in the amblyopic eye, and none in the other eye, and it appeared that the amblyopia arose from the elective use of the good eye. In the treatment of convergent squint, he recognized three aims: the cure of the amblyopia ex anopsia, the removal of the deformity, the securing of binocular vision. The best means for the attainment of the visual result was atropinizing of the fixing eye only. This was only of use when the squinting eye retained the power of fixation.

2. Occlusion of the fixing eye when the squinting eye had lost the power of fixation. There should be total occlusion of the eye for at least one month. More than that was rarely necessary or useful.

3. The exact correction of errors of refraction. He did not hesitate to do this at as early an age as three months, for it was now certain accommodation came into play at a very early age.

4. Operation. As a rule, this should not be attempted until all the other means of rectification had failed, but he endorsed a recommendation made by Priestley Smith many years ago: if in an infant convergence be so great as to render the use of this eye mechanically difficult, tenotomy should be performed at once. The risk of subsequent divergence was less than amblyopia. Simple tenotomy for the rectification

of squint he did less and less; he relied now almost entirely upon advancement of one or both external recti. He drew attention to certain points connected with his mode of performing the operation.

Divergent squint. There were two varieties, which had entirely different origin. The first was associated with myopia of high degree, and was produced in consequence of the lack of accommodative effort, increasing the difficulty of maintaining excessive convergence. Since the eyes of school children had been systematically examined, it had become less frequent. The second order he would call neuropathic. It usually dated from infancy; it was occasional, or constant, unilateral or alternating. There might be feeble fusions; more commonly it was absent. Only in the constant unilateral cases was there amblyopia. In others, vision was perfect. Convergence was always defective, and the degree varied from day to day. The subjects of it were bright and intelligent, but nervous. It was three times more common in females than in males.

Considering heterophoria, he held there was relatively more defect in the relative motor balance of the eyes, but this was kept in check by the fusion faculty. It was the reverse of squint. It was impossible in most cases to demonstrate any particular muscle defect, but the effect of it was manifest in an abnormal tendency to convergence, divergence, or vertical deviation. It was by no means uncommon to find that sufferers from "eye-strain" who had emmetropia in each eye were deficient in motor balance, and to this their trouble was due. Of the varieties of defect, hypermetropia was the most troublesome and the least common. In these last cases of moderate degree the use of prisms was invaluable, but in high degrees advancement of an inferior rectus was preferable.

Mr. H. H. B. CUNNINGHAM (Belfast) laid stress upon the hereditary or family nature of squint. He had traced the characteristic in not a few families. Anisometropia, in a more or less marked degree, seemed a particularly effective ocular defect in determining a squint. Consequently, the fusion faculty must be at a special disadvantage in such cases. On the general lines of treatment he was in agreement with

Mr. Worth. On the matter of training, whilst he held instruments such as the ophthalmoscope and diaphragm test of the greatest value in children of fair age, something was wanted for very young children. For this purpose, two-color pictures had been devised which, when looked at through a green or red screen, showed which eye was fixing. By these pictures, useful practice could be obtained. He agreed in the superiority of advancement over tenotomy, and in the importance of not including the artery of the muscle within the suture. He gave instances of cases which had improved under treatment.

Mr. R. J. COULTER (Newport) drew attention to those cases in which no error of refraction was found in early life; but later, after the existence of squint for some years, astigmatism appeared. He suggested the abnormal pressure of the muscles in excessive convergence might induce this.

Mr. J. B. STORY (Dublin) put the order of procedure in treatment as (1) correction of error of refraction; (2) occlusion of the fixing eye; (3) advancement to correct deformity and permit of fusion training. As regards ætiology, there were cases that he felt were not covered by current theories, cases where squint ought to have appeared, but in which there was none. He had never observed any improvement in an amblyopic eye, nor had he obtained complete fusion in any case of cured squint, except in very young children.

Mr. A. W. ORMOND (London) called attention to a record by Cheselden in the middle of the eighteenth century concerning the lack of appreciation of a patient at the restoration of his sight by cataract couching. It emphasized the fact that amblyopia did not appear unless vision was interfered with before it was properly established. If it had an amblyopia, it was unlikely to be complete at any rate, and vision was recoverable. If vision was interfered with before it was properly established, amblyopia tended to be marked and irremediable. He considered that every effort should be made to remove the squint by operative measures, then the development of the fusion faculty would do more than an active interference with orthoptic appliances.

Dr. INGLIS POLLOCK (Glasgow) said that in advancement it was necessary to exert particular care to obtain equal

stress in the arrangement of the sutures, otherwise distressing hyperphoria might be caused.

Dr. McREYNOLDS (Texas) had heard it said that American ophthalmologists over-emphasized the importance of muscle anomalies formerly. He thought to-day's discussion dispelled that idea. Formerly, there had been a large practice of partial tenotomies in the States, but that had fallen into comparative disuse in favor of advancement. In one point their practice differed from that described by Mr. Worth: they did not sever the tendon, but tucked and folded it in.

Mr. BISHOP HARMAN (London) said the point in the paper that particularly interested him was the note concerning "neuropathic divergence." This defect he considered akin to such other cerebral defects as color-blindness and tone deafness; it was probably referable to an inherent weakness of the fusion faculty. There was great difficulty in treating it, just because the subjects of it never realized that they did squint; the wandering eye promptly returned to its duty when the patient was told of the squint, and they never could see it in the looking-glass. What they did not see, they did not trouble about. It was almost always the friends who objected to the squint. In the "diaphragm test" he had found a most satisfactory means of demonstrating the existence of the squint to these patients; they saw its effect for themselves, and that was the first step in any attempt to improve their condition. Next, it was possible to exercise what little capacity they had for binocular vision, and increase it by the use of the variable patterns of this instrument. He thought he had obtained good results by these means. As regards heterophoria, he believed in the influence these defects had in producing eye-strain, but he thought that this only held good for those people who did near work. A defect that was serious to such a person, did not bother one whose occupation was wholly out of doors. On this account, he was in the habit of correcting these errors in near vision only. He greatly preferred the practice of decentring the lenses worn by the patient to secure prismatic effects, rather than superadding prisms to the lenses. This was more convenient in prescribing, in manufacture, and in wearing.

Dr. K. PISCHEL (San Francisco) spoke of the superior

advantage of sutures obtained from the tendons of rat tails in advancement operations.

Major ELLIOTT, I.M.S., said that heterophoria as a cause of asthenopia was much more common in India than it appeared to be in England. Patients complained of its effects in India, and remarked that these disappeared when in England. He agreed with Mr. Harman that it was only necessary to correct the defect for the purposes of near vision.

Professor R. A. REEVES (Toronto) said that asthenopia from heterophoria was common enough in Canada. He found great benefit from the use of systematic exercise with prisms. In advancement for squint there was a real danger of causing hyperphoria by unequal tension of the sutures. To avoid this risk he always stitched the shortened muscle to the old insertion of the muscle, end to end.

Mr. PRIESTLEY SMITH (Birmingham) asked why Mr. Worth considered it better to advance the muscle to the edge of the cornea, rather than the manner Dr. Reeves had just mentioned. The contrast of the old-time neglect of squint with their present-day careful educative methods was great, and this revolution they owed to the initiation of Javal. Javal once told him that there was hardly any case of squint in which binocular vision and fusion could not be obtained,—given time.

Mr. N. H. PIKE (Cheltenham) said he had had good results in heterophoria by the use of prism exercises. It was a method not made use of nearly enough. He thought that tenotomy should be done as well as advancement, though often the former would be sufficient.

Mr. HARRISON BUTLER (Coventry) said he wished to thank Mr. Worth for his operation; it had proved most satisfactory in his hands. The difficulty arose from cutting out of sutures from the sclera. He was in the habit of combining tenotomy of the opposing muscle with advancement, but the tenotomy was done as its effect was temporary until the advanced muscle was secure.

Dr. ARTHUR GREEN (Norwich) asked what amount of improvement could be anticipated from atropinizing or occluding the fixing eye. Very little, he thought.

Mr. A. LITTLE (Bradford) asked how it was possible, as had been advised by Mr. Worth, that the exercise of the squinting

eye should be carried out by the surgeon. How many sittings did it require?

Mr. HUGH THOMPSON (London) said that occlusion of the fixing eye for a long period was a serious handicap in the school life of the child. He had been in the habit of occluding the eye for only half the day, and with apparently good results.

Dr. J. GRAY CLEGG (Manchester) asked if training was of any use in securing restoration of vision in the squinting eye after the age of eight or nine years. He commented on the existence of cyclophoria in patients without any indications of asthenopia. He approved of Krall's pictures for young children.

The PRESIDENT said that to his mind the great change that had come about in the treatment of squint was due to the recognition that the amblyopia was caused by the squint, and was therefore curable or ameliorable, and was not, as formerly held to be, the cause of the squint.

Mr. CLAUD WORTH, in reply, said that as regards operation he did sometimes shorten and reattach a muscle to its old insertion, but in cases of considerable squint, that did not give enough rotation, and it was necessary to advance the muscle to the corneal margin. It enhanced the action of the muscle considerably. He considered there was little risk of causing hyperphoria if the stitches were inserted parallel to each other, and in line with the old insertion of the muscle. Occlusion of the fixing eye, he agreed, might occasionally be advantageously prolonged beyond four weeks, and at an older age than seven years; but the willingness of the parents to take the trouble had to be considered, and the risk of disappointment. Where vision was improved, the gain was not great. The most favorable age was from three to six years. Two was too early to attempt training, and seven mostly too late. He did not agree with Mr. Ormond that training was most effective if begun after operation; rather he found that operative results were more secure if training of the squinting eye preceded operation. Fusion training should be done by the surgeon: when begun early, perhaps no more than half a dozen sittings were required.

Dr. THOMSON HENDERSON (Nottingham) read a paper on **The comparative anatomy of the ciliary region.**

In the human eye the ciliary region extended from the ora serrata to the iris root, in a zone of uniform breadth of from 6 to 7*mm*. This area was divided into a posterior and comparatively smooth portion, and an anterior plicated region formed by the ciliary processes. In the common farm-yard quadrupeds (horse, cow, sheep, pig, cat, and dog), this same regular arrangement did not obtain. The ciliary processes were not all the same size, and they were smaller and more numerous towards the nasal side, and the smooth posterior part was absent. In effect, it amounted to the prolongation of the retina forwards on the nasal side, a provision apparently correlated with the necessity for a wide field of vision towards the flank. This bore on the mechanism of accommodation and had to be considered in the light of the author's previous work. His purpose here was to bring forward a hitherto unrecognized feature, and to suggest an explanation of it.

Mr. BISHOP HARMAN asked if Mr. Henderson found any variation of this striking peculiarity in animals, the shape of whose pupils was narrowed vertically, as in the cat, or horizontally, as in the horse or goat.

Dr. HENDERSON replied that there was no difference; both were alike in the advancement of the retina towards the periphery.

Dr. W. B. INGLIS POLLOCK read a paper on **The treatment of chronic dacryocystitis.** Pathological examination of excised lachrymal sacs had enabled him to prove that the subadenoid layer was greatly swollen and thrown into folds by a dense cellular infiltration. Such a condition was obviously unsuited to the old treatment of probing, which was likely to accentuate it and produce stricture. The dacryocystitis was secondary to a septic focus, most frequently in the nose, and its cure was best effected by regular and persistent lavage of the sac and duct. In private patients a short course of syringing usually effected a cure, but in hospital patients the results were not so satisfactory, probably because the condition was commonly advanced before they were seen. If, after three months' lavage, a cure was not effected, excision of the sac should be resorted to.

Mr. T. HARRISON BUTLER (Coventry) read a paper describing **A new operation for the extirpation of the lachrymal**

sac. He said it was essentially a modification of Meller's operation. The site of the sac was rendered anæsthetic and anæmic by the injection of codrenine. The primary incision was through the skin only. It took the form of a half circle, with the centre at the canthus. The flap was carefully dissected up, avoiding buttonholing or wounding of the veins underlying the nasal side of the incision. The palpebral ligament was then isolated, and the deep fascia split vertically, so as to expose the sac. The sac was freed from its bed with blunt-pointed scissors, and pushed down under the ligament. Then the canaliculi were severed, and the sac drawn down towards the duct, twisted to a cord, and cut off. The operation was bloodless and painless, and no retractors were required, only sutures to hold back the flap and secure the ligament. He had done the operation seventy or eighty times, and was more than pleased with the results.

Mr. BISHOP HARMAN said that in his experience the difficulty of removing the lachrymal sac arose from attempts to see it. In this operation, touch was better than sight. The bed of the sac could be perfectly defined to the sense of touch. One could establish the actual position of the sac by means of a probe passed through the lower canaliculus into the sac itself. This procedure left no room for mistake. That done, he gripped the tissue between the fascia and bone, and removed it bodily. The removed tissue contained the sac and little else. He did not hesitate to cut the palpebral ligament, and had never found any ill effects from that.

Mr. JOHN HERN (Darlington) agreed with Mr. Harman that removing the contents of the lachrymal groove was the best procedure. But he did not favor indiscriminate operation. Most cases could be cured by syringing, preferably with weak iodine solution. For some, the use of a silver style and probing was very beneficial. Mr. CLAUD WORTH said the practical adandonment of probing was a great advance; syringing should be the main procedure. Excision was a last resort, and slitting of the canaliculus should almost never be practised.

Dr. CUNNINGHAM (Belfast) said enough attention was not directed to the primary case of dacryocystitis, which was commonly in the nose. Recently he had seen a case where cure of ozæna relieved the lachrymal trouble.

Mr. W. ALLPORT (Birmingham) said that, in his experience, it was never necessary to excise the sac unless an intraocular operation were contemplated. His practice was to use silver styles, and their insertion and retention had the most beneficial effect.

Mr. PRIESTLEY SMITH confirmed this statement of his colleague.

Mr. F. GRAINGER (Chester) also approved the use of silver styles, and in cases where abscesses had supervened, recommended the use of chloride of zinc paste to the interior of the sac; it destroyed the diseased mucous membrane, and the fistula soon closed.

Mr. A. W. ORMOND (London) said styles were elusive things; he had once found three in one patient.

Mr. JAMESON EVANS (Birmingham) doubted if styles would cure the primary condition; excision secured a permanent result, and relieved the patient of serious risks.

The PRESIDENT said he had tried both styles and excision, and each of those procedures had its uses. He did not find any benefit in hollow styles over the solid ones. He agreed that more attention should be paid to the nasal conditions. When that was done, sac troubles would probably disappear.

Dr. POLLOCK, in reply, said that excision was rarely necessary in private patients, but it was frequently so in working people, from the cause he had explained.

Mr. BUTLER, in reply, said that in his operation he aimed at removing the sac alone; the removal of a lump of tissue was not good surgery.

MEETING OF FRIDAY, JULY 28, 1911. HENRY EALES, M.R.C.S., PRESIDENT, IN THE CHAIR.

Professor J. BERRY HAYCRAFT described an instrument he had introduced for the purpose of **mapping out the color-blind margin of the blind spot.** The paper had previously been published in the *Journal of Physiology*, vol. 40, No. 6, Aug. 15, 1910, to which reference may be made. Remarks on the paper were made by Mr. Tomlinson, who showed and explained his scotomograph, which was commented upon by Mr. Harrison Butler.

Miss AMY SHEPHERD, M.B. (London), read a paper on

Extraction of the lens in its capsule. She considered that this was the operation of election in the great majority of cases of operable cataract, excepting those of children and young people and a few hypermature senile ones. She said it was indispensable, in that it was the only safe and effective operation in immature cases. The paper was mainly based on personal observation of more than 650 such extractions, over 260 of which had been done by herself, under Colonel Smith's kind supervision, at Amritzar, Punjab, earlier in the year.

After carefully preparing the patient and the instruments, an almost radial incision was made through the cornea. Iridectomy was done in nearly all cases, solely to guard against prolapse. She gave full details of the operation, and showed drawings of the various stages. The eyes were left tied up for ten days, when the patients were allowed to go home. In skilled hands, vitreous escaped in about five per cent. of the cases. The various complications at and following the operation were discussed. Undoubtedly the operation was more complicated, and necessitated the presence of a skilled assistant. There was greater liability to the escape of vitreous, though that mattered but little, and some said there was a greater liability to simple prolapse of the iris. Its advantages were: Much less liability to irido-cyclitis; less liability to sepsis due to the absence of cortical matter and capsule; and less liability to tension due to capsule in the wound. The visual results were better than after the old operation. There was no after-cataract involving a second operation, and it was a thoroughly effective operation for immature cases.

Mr. GRAY CLEGG (Manchester) had had a small experience in doing the operation, and from his results he felt warranted in further practising it.

Major ELLIOTT, I.M. S. (Madras), did not favor the operation. He considered that prolapse of the iris and vitreous was more common in the intracapsular operation. He thought that four suppurations in 650 cases was enormous, and felt that the capsule and cortex remaining in the eye constituted no danger at all, so long as it was not in the wound. More statistics were required, and he urged all those who could do so to bring their results. He did not think that a

small iridectomy did any harm, and the visual results were almost the same with and without it.

Mr. A. W. ORMOND (London) considered that no operation which necessitated the doing of an iridectomy could be regarded as the operation of election; he thought the advantages of an intact pupil were enormous.

Dr. R. A. REEVE (Toronto) was greatly in favor of McKeown's method of washing out the cortex, and this method greatly facilitated the operation in immature cases, and, if resorted to habitually, would greatly lessen the necessity of the intracapsular operation.

Captain A. E. J. LISTER, I.M.S., said that his series of ninety-eight cases in which vitreous was lost, and in which no harm resulted, was not sufficient to warrant the statement that no subsequent bad results followed. More cases would have to be investigated. He considered that the eye which was free of all cortex and capsule was in an infinitely better position than the one in which both were present, and the after-results would be different also. An eye, however, which had its vitreous exposed was far more liable to suppuration than was one in which the posterior capsule was intact.

Dr. JOHN O. MCREYNOLDS (Texas) said that the intracapsular operation had produced a very favorable impression in America, and those who had studied the operation most carefully were the most enthusiastic in its favor. Others, such as Savage, of Nashville, had modified the operation as the result of their own experience.

Colonel SMITH, I.M.S. (Amritzar), thanked Dr. Shepherd for coming to the Punjab to see for herself his methods. His own experience as to loss of vitreous fully confirmed Captain Lister's investigations. He answered a good deal of criticism of his methods by others, and said that there was no difficulty in following up cases in the Punjab, and he hoped in a few years to be able to give the after-results in several thousands of cases; but the difficulties were great. The great advantage of his operation was that it was complete and not partial, for the whole of the opaque matter was removed, and this was the cause of the absence of iritis in his cases. If the capsule were adherent, he looked upon needling as a very serious operation indeed, and complications were frequent. He

strongly condemned the early needling of the capsule before the eye was quiet, as a most unsurgical proceeding. A violent irido-cyclitis was liable to be the result, and in a case he had seen which was needled on the seventh day, the eye was lost from this cause. He thought the capsule ought either to be dealt with at the time of the extraction, or else not until a month after all signs of irritation had disappeared. The great advantage of the intracapsular operation was, that it was the most highly technical operation in surgery, and few surgeons had sufficient material to become proficient at it.

Mr. A. F. MacCallan (Cairo) read a paper on the **Egyptian Ophthalmic Hospitals.** He stated that considerable progress had been made during the last year. Clinical work was in active progress in two built hospitals at Tanta and Assiout, and three new permanent hospitals were in course of construction at Mansoura, Beni Suef, and Zagazig; and money had been collected for others. £30,000 had been obtained for capital expenditure. About ninety-seven per cent. of the fellahin had some form of eye disease, chiefly trachoma, and it was impossible to treat anything like all the cases. Further developments should be on the lines of the travelling hospitals, as originally founded by Sir Ernest Cassel. The permanent hospitals would act as a base, to which the more severe cases could be sent. All the posts, except one, in the ophthalmic staff were filled by Mr. MacCallan's own pupils. In 1910, at the three hospitals, 14,342 patients were chosen for treatment, out of 25,514 would-be patients. It was rarely possible on any day to accept all the patients who applied for treatment. The average number seen each day at each hospital was 228. The highest percentage of total blindness in Egypt was at Asswan and Sokay, where it amounted to twenty-five per cent. Numerous tables and figures were given showing the diseases treated and the causes of blindness.

Captain A. E. J. Lister, I.M.S., thought that trachoma was of importance if a cataract were to be extracted in its capsule. It should be treated first.

Mr. Harrison Butler (Coventry) said that his experience in Jerusalem was that a very large proportion of cases operated upon for cataract were trachomatous, and septic compli-

cations were no more frequent than in Europe. Pure trachoma, uncomplicated by secondary septic troubles, had no influence on the result.

Colonel H. SMITH, I.M.S. (Amritzar), thought that severe trachoma was a bar to operating for cataract; but slight trachoma had no more serious result than that the eye was liable to remain red and angry-looking for a longer time than usual.

Dr. LEONARD J. C. MITCHELL (Melbourne) read a paper on the **use of carbon-dioxide snow in ophthalmic work.** He had treated many cases with this material while House-Surgeon at Moorfields, and considered that it was of real value as a curative agent, in so far that it brought about inflammatory reaction easily and safely, and was therefore of practical use in every-day ophthalmic treatment. He thought that expensive and cumbersome apparatus was quite unnecessary. All that was required was a chamois-leather bag, tied closely round the nipple of a gas cylinder, with the nipple at the lowest part of the cylinder. The snow collected was rammed hard into a suitable shape, and could then be held in cotton-wool by the surgeon, and applied to the desired part. For the everted lids, ten to fifteen seconds sufficed, and the lid should be allowed to thaw before it was replaced. A little cocaine ointment was desirable afterwards, but not before the application. In rodent ulcers the raised edges should be attacked rather than the base of the ulcer. In trachoma a violent vascular reaction set in, and this caused the good results. An application once in ten days with a hard pencil and a pressure of about 6 ozs. from 10 to 15 seconds was sufficient. No other drastic treatment was adopted in 37 cases, and within six months no recurrence had taken place in 7, and in others, relapses could always be controlled by a further application. Pannus and ulcers cleared in a remarkable manner. In nævi of the skin the results were excellent. Three applications cured a long-standing case of spring catarrh, and rodent ulcers were most successfully treated. The cost was extremely low, and the apparatus was of the simplest. He considered that it cured rodent ulcers when the bone was not involved. It relieved all cases of trachoma, and cured about twenty per cent. It cured nævi of all types.

Mr. DEVEREUX MARSHALL (London) said that he felt sure he had in this reagent a very potent remedy. He congratulated Dr. Mitchell on the good results he had reported, and felt sure that after listening to the paper many would be encouraged to try it for themselves.

Mr. BISHOP HARMAN (London) read **a criticism on the blind and the Census of 1911.** In previous years there was a column for "Blind," and this year for "Totally Blind"; and the addition of this adjective had destroyed one of the most useful of the Census returns, both by unduly limiting the enquiry made, and by presenting a conundrum of no little difficulty to those who had to fill up the form. Many people who would not consider themselves blind, who could just find their way about alone, might, for educational purposes and for purposes of ordinary employment be described as blind. He had endeavored to get the authorities to realize this, but apparently without success. He analyzed the answers given in 312 cases he had been able to ascertain, and he found that 120 had disregarded the "totally blind" and had entered them up of their own initiative as "partially blind." This showed the great desirability for a differentiation of the Census designation of the blind. Many partially blind, or blind for all practical purposes, were never enumerated at all, so that the results would be most misleading, and quite valueless. Tables showing the real state of the vision in the cases he was able to trace were then given. He suggested that a Subcommittee should be appointed by the British Medical Association to investigate the matter, and make such representations to the proper authorities as may be deemed fit.

Mr. C. W. HUTT, Asst. M.O.H., Warrington, thought the subject a very important one, and that great pains should be taken to ensure accurate results. He thought that explicit directions should be given to schoolmasters and parents as to what was required of them.

Mr. BISHOP HARMAN (London) described **a new photometer for the use of school doctors.** This was a convenient form of the old grease-spot photometer, which could be used to investigate the light of class-rooms, etc. It was made by Messrs. F. Davidson & Co., 29 Great Portland Street, W., and its cost was not great.

Fig. 1 (Neugeborenes).

Fig. 2 (Neugeborenes).

Fig. 3 (80 Jähr.).

Fig. 4 (80 Jähr.).

Fig. 5 (82 Jähr.).

Fig. 6 (59 Jähr.).

Fig. 7 (40 Jähr.).

Fig. 8 (77 Jähr.).

ILLUSTRATING DR. BARCK'S ARTICLE ON "A SIMPLIFIED METHOD OF EXTIRPATION OF THE LACHRYMAL SAC."

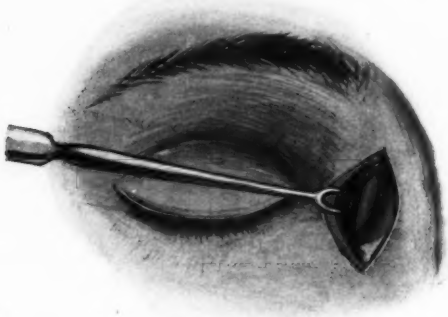


FIG. 1.

FIG 2.

FIG. 3